U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
PB-251 723

MOBILE LIDAR STUDY OF THE LOS ANGELES MIXING LAYER

System Innovation and Development Company

Prepared for
Environmental Sciences Research Laboratory

February 1976

TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA/600/4-76-009	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE MOBILE LIDAR STUDY OF THE LOS ANGELES MIXING LAYER		5. REPORT DATE February 1976 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) David T. Liu		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS System Innovation & Development Corp 707 Silver Spur Road, Suite 202 Rolling Hills Estates, CA 90274		10. PROGRAM ELEMENT NO. 1AA009 11. CONTRACT/GRANT NO. 68-02-1305
12. SPONSORING AGENCY NAME AND ADDRESS Environmental Sciences Research Laboratory Office of Research and Development U.S. Environmental Protection Agency Research Triangle Park, N.C. 27711		13. TYPE OF REPORT AND PERIOD COVERED Final Report 14. SPONSORING AGENCY CODE EPA-ORD

15. SUPPLEMENTARY NOTES

Lidar data tapes are a part of the LARPP data archive.

16. ABSTRACT

This program was conducted in support of the Los Angeles Reactive Pollutant Program (LARPP), jointly sponsored by the Coordinating Research Council and the U.S. Environmental Protection Agency. A mobile Lidar system, mounted in a van, was used to depict the temporal and spatial variations of the mixing depth over the Los Angeles Basin, during the LARPP field tests in the fall of 1973. Lidar profiles are interpreted and compared to vertical temperature and moisture profiles measured by helicopter and standard meteorological sounding techniques. Lidar echo anomalies are classified into mixing layer height or significant levels based on backscatter slop evaluation. The qualitative aspects of each backscatter signature are used in describing the nature and altitude of inversion bases, moisture layers, stratus and fog layers.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Boundary Layer Optical radar	Los Angeles Basin	20D 17H

18. DISTRIBUTION STATEMENT RELEASE TO PUBLIC	19. SECURITY CLASS *(This Report)* UNCLASSIFIED	21. NO. OF PAGES 239
	20. SECURITY CLASS *(This page)* UNCLASSIFIED	22. PRICE $8.00-2.25

EPA Form 2220-1 (9-73)

PRICES SUBJECT TO CHANGE

PB 251 723

EPA-600/4-76-[illegible]
February 1976

Environmental Monitoring Series

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

EPA-600/4-76-009
February 1976

MOBILE LIDAR STUDY OF THE LOS ANGELES MIXING LAYER

BY

David T. Liu
System Innovation & Development Corp.
Rolling Hills Estates, Calif. 90274

Contract No. 68-02-1305

Project Officer

Charles R. Hosler
Meteorology and Assessment Division
Environmental Sciences Research Laboratory
Research Triangle Park, N.C. 27711

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT
ENVIRONMENTAL SCIENCES RESEARCH LABORATORY
RESEARCH TRIANGLE PARK, N.C. 27711

RESEARCH REPORTING SERIES

Research reports of the Office of Research and Development, U.S. Environmental Protection Agency, have been grouped into five series. These five broad categories were established to facilitate further development and application of environmental technology. Elimination of traditional grouping was consciously planned to foster technology transfer and a maximum interface in related fields. The five series are:

1. Environmental Health Effects Research
2. Environmental Protection Technology
3. Ecological Research
4. Environmental Monitoring
5. Socioeconomic Environmental Studies

This report has been assigned to the ENVIRONMENTAL MONITORING series. This series describes research conducted to develop new or improved methods and instrumentation for the identification and quantification of environmental pollutants at the lowest conceivably significant concentrations. It also includes studies to determine the ambient concentrations of pollutants in the environment and/or the variance of pollutants as a function of time or meteorological factors.

This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161.

DISCLAIMER

This report has been reviewed by the Environmental Sciences Research Laboratory, U.S. Environmental Protection Agency, and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the U.S. Environmental Protection Agency, nor does mention of trade names or commerical products constitute endorsement or recommendation for use.

ABSTRACT

This program was conducted in support of the Los Angeles Reactive Pollutant Program (LARPP) jointly planned by the Environmental Protection Agency (EPA) and the Coordinating Research Council (CRC). The objective of this program was to observe the temporal and spatial variations of the atmospheric mixing layer by using a mobile Lidar system in the Los Angeles Basin in conjunction with the LARPP experiment. The observations along with the results of the comparison analysis involving meteorological and air quality data will be used for the evaluation of air quality simulation models. These field data are essential for the development of realistic and accurate air quality simulation models used in analyzing pollution control strategies.

The effectiveness of using the mobile Lidar system for observing the temporal and spatial variations of the atmospheric mixing layer has been demonstrated. It has also been demonstrated that the Lidar system is a cost-effective means of gathering such field data. Operational readiness of the mobile Lidar system proved to be quite high throughout the entire LARPP program period. Intensive teamwork rendered equipment breakdowns to be of minimal impact on total system readiness and performance.

Significant correlation was found by comparison of Lidar data to meteorological observations made. Temperature and moisture profiles compared well with Lidar information. The analysis made in comparing the observed Lidar data with the meteorological data gathered by the helicopter under the LARPP program showed good correlation.

More field data are needed to better establish the temporal and spatial variation of the mixing layer. The knowledge of the temporal and spatial variation of the mixing layer could be greatly extended by utilizing multiple Lidar systems in stationary and/or mobile modes of operation. This will further benefit the development of more realistic simulation models.

This report was submitted in fulfillment of Contract Number 68-02-1305 by System Innovation and Development Corporation under the sponsorship of the Environmental Protection Agency. Work was completed as of May 1975.

TABLE OF CONTENTS

Page

Abstract iii

List of Illustrations vi

List of Charts viii

Acknowledgments x

Sections

I Conclusions 1

II Recommendations 3

III LARPP Program and the Mobile Lidar Operation 4

IV Description of Mobile Lidar System 6

V Instrumentation and Data Processing System 11

VI Lidar Data Readout and Processing 15

VII Discussion of the Observed Lidar Data 22

VIII Glossary 146

IX Appendixes 147

ILLUSTRATIONS

No.		Page
1	Mobile Lidar Van	7
2	Schematic of Receiver and Transmitter	9
3	Major System Components	12
4	Recorded Data Format	13
5	Example of Digital Printout From Data Tape	16
6	Tape Format for Numerical Data Summary	19
7	Polynomial Fit to Data With Normalized Residual	21
	Mobile Lidar Route Map Mission Day	
8	10/5	28
10	10/10	34
12	10/11	39
14	10/12	44
16	10/15	51
18	10/16	57
20	10/17	64
22	10/18	70
24	10/24	76
26	10/25	82
28	10/26	88
30	10/27	94
32	10/29	101
34	10/30	107
36	10/31	113
38	11/1	119
40	11/2	124
42	11/5	131
44	11/6	138
46	11/7	144

ILLUSTRATIONS (Continued)

No.		Page
	Mixing Layer Height Along Observational Routes Mission Day	
9	10/5	29
11	10/10	35
13	10/11	40
15	10/12	45
17	10/15	52
19	10/16	58
21	10/17	65
23	10/18	71
25	10/24	77
27	10/25	83
29	10/26	89
31	10/27	95
33	10/29	102
35	10/30	108
37	10/31	114
39	11/1	120
41	11/2	125
43	11/5	132
45	11/6	139
47	11/7	145

CHARTS

No. Page

1 Lidar System Characteristics 8
2 Mobile Lidar Mission Summary 25

Comparison of Lidar Mixing Layer Height With Meteorological Observations

Mission Day -

3 10/5 26
5 10/10 31
7 10/11 37
9 10/12 42
11 10/15 48
13 10/16 54
15 10/17 60
17 10/18 67
19 10/24 73
21 10/25 79
23 10/26 85
25 10/27 91
27 10/29 97
29 10/30 104
31 10/31 110
33 11/1 116
35 11/2 122
37 11/5 127
39 11/6 134
41 11/7 141

Summary of Operation
Mission Day

4 10/5 27
6 10/10 32
8 10/11 38
10 10/12 43
12 10/15 49
14 10/16 55
16 10/17 61
18 10/18 68
20 10/24 74
22 10/25 80
24 10/26 86
26 10/27 92
28 10/29 98

CHARTS (Continued)

No.		Page
	Summary of Operation Mission Day	
30	10/30	105
32	10/31	111
34	11/1	117
36	11/2	123
38	11/5	128
40	11/6	135
42	11/7	142

ACKNOWLEDGMENTS

The guidance and direction of the Project Officer, Mr. Charles Hosler, and Dr. Jim McElroy, are gratefully acknowledged. Special recognition and acknowledgment are made for the fine technical contribution to this program by Mr. James Karney, and the inspiration and critique by Dr. James Edinger.

Sincere thanks are expressed to Dr. William Perkins of Metronics Inc. for his direction in the LARPP operation, and to Mr. Alan Zengel of the Coordinating Research Council for his sponsorship and coordination of the LARPP program.

Valuable synoptic and meteorological supporting data were provided by the Air Pollution Control District of Los Angeles and the National Weather Service.

Special thanks to Shirley Schey for her diligence and perseverance in the preparation of the manuscript.

SECTION I

CONCLUSIONS

This project entailed the operational use of a developed Lidar and electronic technology toward the solution of a remote sampling problem involving time and distance constraints. The task of combining electro-optical and electronic processing equipment, and gas powered generators, for mobile operation in a van, was not accomplished without difficulty even though all the equipment had existed as off-the-shelf components. The typical systems integration problems such as ground loops, voltage compatability and spurious transients quickly appeared but were never a major cause of total system failure. Operational readiness of the mobile Lidar system proved to be quite high throughout the entire LARPP program period. The major cause of any breakdowns were found to be discrete component failure within the laser power supply and overload capacity of the water cooling unit. Teamwork between contractor and subsystem supplier rendered these breakdowns to be of minimal impact on total system readiness and performance. Daily inspection of optical alignment and boresight revealed very minor disturbances caused by road shock and vibration.

A comparison of all Lidar data to surface and rawin observations made during the LARPP period, revealed rather significant trends and correlation. Temperature and moisture profiles from the radiosondes proved to be of the greatest aid for initializing the altitudes of the inversion and stratus before beginning each day's operation. Identification was facilitated by using the midday release, particularly that data from the LAX office. It was noted that for Lidar operation within a boundary of approximately 15 miles from the coast line, the best correlation always existed using the LAX data. Early morning temperature profiles obtained at the El Monte station usually deviated from those obtained at the launch site to render those data points of less significance in the overall comparison effort.

Since the basic program objectives were to provide continuous readings of mixing layer depth, attempts were made for the Lidar van to follow wind trajectories and monitor the levels en route. The spatial variability of the temperature and moisture profiles, and hence the Lidar returns, were somewhat difficult to interpret especially since these parameters can be strongly modified by local geographical features. This was indicated during the run on 10/5/73 when observations were made traveling in an easterly direction toward the San Gabriel Mountains. In this report the height is referenced to the altitude above ground level (a.g.l.).

Several observations, such as those on 10/14/73 and 10/24/73, revealed only minor, if any meaningful, comparisons to radiosonde reports, again possibly due to unique temporal or spatial variability. Tracing the air mass movements at a fixed location can sometimes alleviate this ambiguity as one usually starts using some baseline measurement and collects a data history from that time onward.

Cases exist involving small vertical temperature gradients up to altitudes of several thousand feet. The Lidar returns for these days again show negligible correlation to radiosonde profiles due to almost homogeneous mixing of the aerosols within this boundary.

Noted also in several of the daily observations was the variability of signal return that occurred with very slight changes in the ambient humidity. For water concentrations above 70% humidity, it was reported that an overall change in particulate size, and hence optical scattering, can also occur. This effect can be seen during a timed sequence of firings when the wind direction shifted and moisture content changed.

SECTION II

RECOMMENDATIONS

The overall effectiveness of a basic Lidar system to monitor and record the dynamic variations of the atmospheric structure has been demonstrated. The limitations imposed by the technique used in the LARPP program may be in part due to the wide area coverage required for operation of a single instrument. Because of the wide degree of spatial variability exhibited in the data, it is believed that a more systematic series of observations could be used to better delineate the characteristics of the advected air masses. This might be accomplished by either a network of three mobile Lidar systems or a single unit operating along a fixed route.

At selected locations in the northwestern, southeastern and eastern sectors within the L.A. basin, mobile Lidars can be operated to provide a network of closely coordinated observations. The mobile Lidars could provide sufficient amount of data to completely describe the temporal and spatial variations of the mixing layer height over the entire L.A. basin.

A second method, although not as efficient in resolution qualities, would be using a single mobile system to record cross section variations along a boundary flow. This task would require the designation of a vehicle route that would be representative of the flow regime or the typical cross section through the L.A. basin.

The basic capabilities of the Lidar for obtaining a detailed atmospheric survey within a fixed volume would be the primary asset in this example.

SECTION III

LARPP PROGRAM AND THE MOBILE LIDAR OPERATION

The Los Angeles Reactive Pollutant Program (LARPP) operation was jointly sponsored by the Environmental Protection Agency (EPA) and Coordinating Research Council (CRC) for the specific purpose of obtaining a complete data package suitable for modeling the transport, diffusion and chemical reactions associated with air pollutants subject to photo-chemical processes. As a result of earlier programs in the Los Angeles basin, LARPP was conceived in 1971 as a Lagrangian type operation, i.e., aerometric measurements would be made within a moving air parcel as it traversed the Los Angeles basin. As nearly as possible data were to be taken in real time. While results were to have general applicability, the Los Angeles basin was selected for the test area for a number of reasons: concentrations of photo-chemical pollutant and precursors are relatively high on a continuous basis; mobile and fixed sources are documented; there are extensive surface air sampling networks in operation; and the Air Resources Board facilities are available including a mobile van.

Several groups participated including: EPA (helicopter instruments and ground level radiation measurements); NOAA (tetroon operations and radar tracking); ARB (mobile van and laboratory support for GC analysis of bag samples); General Research Corporation (data management); System Innovation and Development Corporation (Lidar); and Metronics Associates, Inc. (tracer and overall operation control). Approximately sixty people were involved in the field operations.

Field work was begun early in September 1973 and completed in mid-November. To achieve the program objective, operations were started as early in the day as possible from a site having a significant pollutant source and a forecast trajectory as long as possible. These conditions were not always compatible. A total of five sites were used: two were used most frequently (downtown Los Angeles - 17 tests; Downey - 12 tests).

In outline, a typical operation proceeded as follows. Three tetroons were launched simultaneously from a single location ballasted to fly below the inversion base. The position of each was established by radar at one-minute intervals and plotted at the Operation Center (OC). As soon as the centroid of the tetroon pattern was established, FP tracer was released by helicopter in a one-half mile square pattern around the centroid approximately midway between the ground and inversion base. After completion of the fifteen-minute tracer release the first of two instrumented Bell 212 helicopters began a series of seven-minute constant altitude rectangular flight patterns around the centroid starting near the inversion base. A second radar continuously tracked the aircraft and reported positions to the OC. Four flight levels were used, the lowest 200 feet above ground. Normally, the aircraft would descend, ascend and descend a second time through each level before returning to base. The second aircraft began at the top level when the first aircraft completed its final flight pattern at the lowest level. Subject to airway control problems, it was possible to maintain the flight pattern close to the tetroon centroid. On occasion both aircraft were flown in separate flight patterns simultaneously. The ARB van was directed along the centroid path by OC; data were taken continuously both en route and at fixed locations along the path. Tracking time for each operation varied from two to eight hours.

Aircraft and van measurements included: O_3, NO, NO_x (concurrently), CH_4, non-methane hydrocarbon, CO, tracer concentration and air temperature. Bag samples for GC analysis were taken from all vehicles. In addition, the aircraft measured dew point and aerosol light scattering. All data were recorded on magnetic tape in a 6-7 second cycle time. Backup strip charts were also used.

Lidar measurements from a mobile van were made along the projected track. The movement of the mobile Lidar van was directed by the central operation center through the two-way radio communication system for each mission day. The mobile Lidar started the operation at the launch site prior to launching of the tetroon. Then under direction of OC the mobile Lidar van normally followed the tetroon movement. In all the operations, the Lidar van was separated by a few miles from the helicopter's operation. The mobile Lidar system operated in both stationary and mobile modes, depending on the instruction received from OC.

SECTION IV

DESCRIPTION OF MOBILE LIDAR SYSTEM

The principal utility of a Lidar in any meteorological or air pollution studies is its ability to provide a remote detection capability. Although its uses may vary somewhat, the basic Lidar configuration of monostatic laser transmitter and receiver has remained unchanged throughout many years of research investigations. The compact arrangement of optics lends itself well to portable field operation, being independent of any external sources of electromagnetic radiation. The configuration of Lidar components chosen for use by SI&D in its mobile instrumentation van are depicted in Figure 1. The Lidar unit is situated on a two-axis, hand-cranked platform within the van to allow its use in all angles between the horizontal and vertical firing position. All electronic controls, firing indicators and photographic storage are conveniently situated to allow ease of operator adjustments even during mobile operation.

The characteristics of the basic laser transmitter and receiver are described in Chart 1. The ruby laser transmitter is a standard off-the-shelf unit. Its rugged mechanical design and resonator stability is particularly well suited to withstand the rigorous vibration environment encountered during mobile operation. The laser and power supply electronics are designed for continuous duty operation as found in production line welding and metal working applications. The laser rod and lamps are totally submerged in water during operation. Cooling water is provided by a 2000 BTU refrigerated system that can maintain laser head temperature within 1°F even when ambient conditions approach 100°F.

Each pulse of Q-switched energy is transmitted as a quasi-collimated beam lasting approximately 20 nanoseconds. The scattering interaction with the atmosphere from each outgoing pulse produces a signature that is collected by the receiver optics.

The Lidar receiver consists of an 8-inch Cassegrain telescope and photomultiplier detector. A schematic diagram of this assembly is shown in Figure 2. The optic axis of the receiver is located approximately 11 inches from that of the laser. The optical field of view is nominally adjustable between 0.2 milliradians and 10 milliradians. For all operations conducted during the observational period, however, the

Reproduced from best available copy.

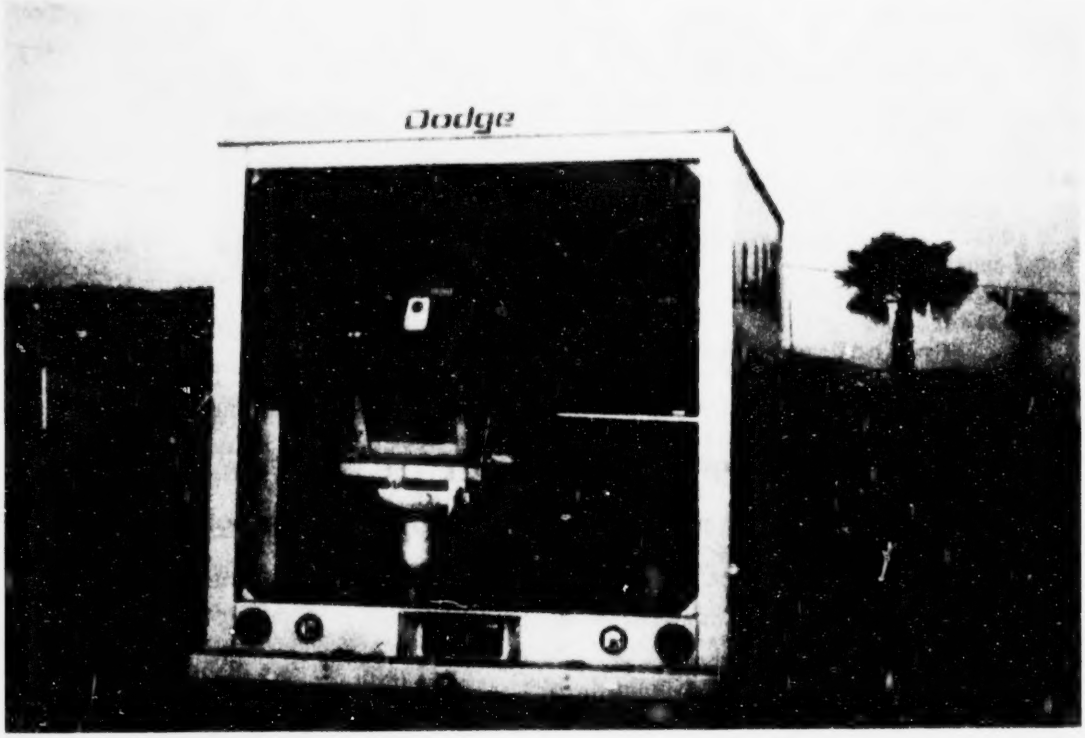
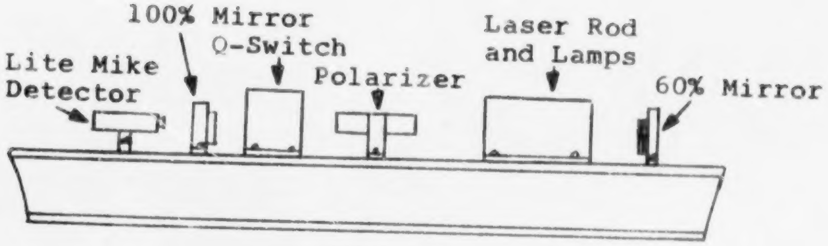


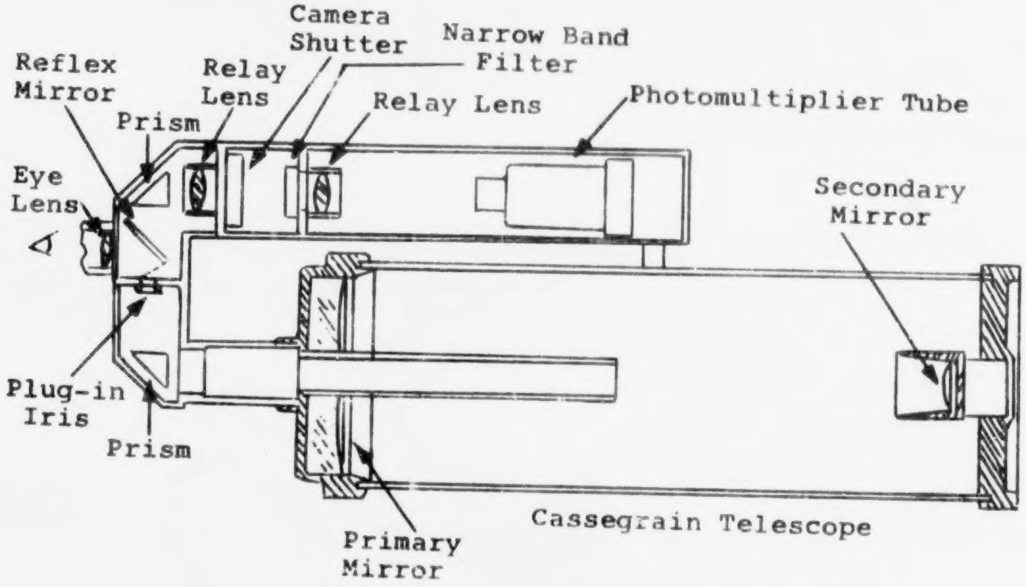
Figure 1. Mobile Lidar van

Chart 1. LIDAR SYSTEM CHARACTERISTICS

Transmitter	
Laser wavelength	6943 Angstroms
Pulse Energy	0.5 - 2.0 joules
Firing rate	4 ppm
Pulse width	25 nanoseconds
Duty cycle	Continuous
Beam divergence	2.5 milliradians
Beam diameter	0.375 inch at exit
Cooling	Circulating water
Receiver	
Collecting aperture	8-inch Cassegrain
Optical efficiency	0.55 (overall inc. filter)
Bandpass filter	50 Angstrom @ 6943 Å
Detector	ITT FW-130, S-20 response
Field of view	0.2 - 10 milliradians


100% Mirror
Q-Switch
Laser Rod
and Lamps
Lite Mike
Detector
Polarizer
60% Mirror

Laser Transmitter - Component Layout


Camera
Shutter
Narrow Band
Filter
Reflex
Mirror
Relay
Lens
Relay Lens
Photomultiplier Tube
Prism
Eye
Lens
Secondary
Mirror
Plug-in
Iris
Prism
Cassegrain Telescope
Primary
Mirror

Receiver Module

Figure 2. Schematic of receiver and transmitter

unit was kept at 10 milliradians. A spectral bandpass filter of 50 Angstroms is used in the receiver to minimize background sky illuminance. A parallex adjustment between the two units allows one to vary the angle of intersection between optic axis, and thus maximize the volume of interaction within the atmosphere. A removable prism viewfinder within the receiver allows visual sighting along the same optical axis of the photomultiplier detector. The receiver field of view can be manually adjusted to coincide with the center of the laser pulse cross section by visually sighting through the optics to some distant target and then firing the laser. A mechanical locking fixture clamps both units rigidly when boresight has been established.

The transmitter and receiver units are solidly mounted to a two-axis platform which is hand adjustable in azimuth over 360° and elevation from 0 to 90°. Normally the Lidar is set up to operate in the vertical position by firing through a hole in the roof of the instrument van.

Each Lidar pulse transmitted must also be measured for its energy content and subsequently recorded to provide data normalization. Pulse energy monitoring is accomplished with an EG&G lite mike detector head mounted internal to the laser transmitter. A small fraction of the oscillator energy, leaked through the rear resonator element, is detected and a waveform generated that is proportional to the transmitted pulse energy. A sample-and-hold circuit then processes each pulse for insertion into the data loading format for recording on magnetic tape.

The Biomation 610B waveform digitizer, electronic interface module and Kennedy 1500 recorder altogether comprise the elements of the recording system.

Other equipment contained within the van include a Tektronix 546 oscilloscope for real time monitoring of each backscattered pulse. A Polaroid camera attachment is used to provide hard copies of selected signal returns that are presented on the oscilloscope.

Electrical power for the mobile instrumentation van is provided by a 15 kw gasoline generator towed behind the van.

SECTION V

INSTRUMENTATION AND DATA PROCESSING SYSTEM

Early field investigations using the Lidar were somewhat limited in data recording aspects due to the requirement for photographing each backscatter pulse as it appears on the display oscilloscope. Current advances in data recording, processing and display have made the Lidar system an effective means of acquiring atmospheric data.

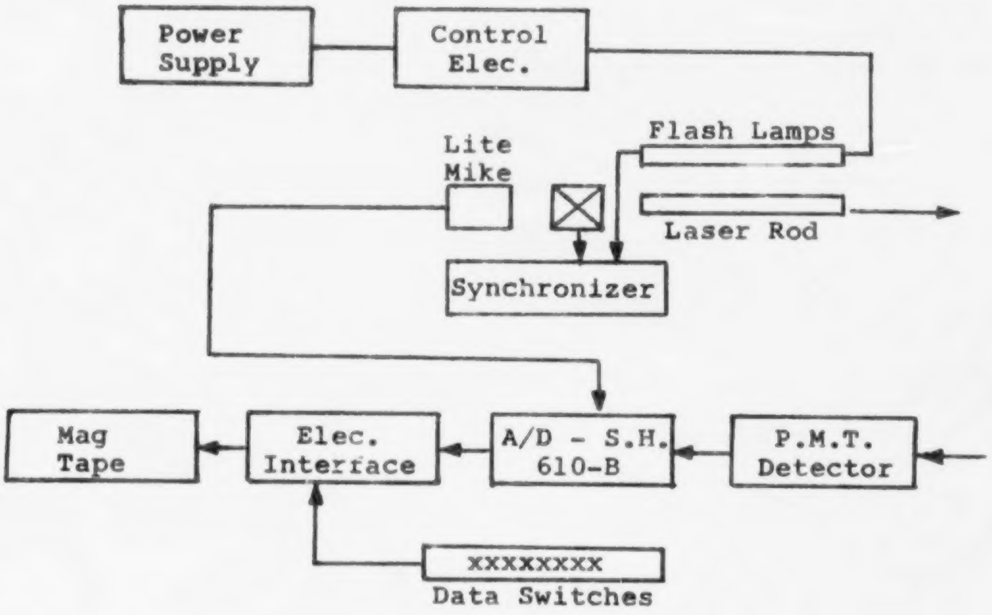
Any type of operational data gathering has to be cost-effective from the standpoint of time and man-hours spent to both collect and interpret the data. Today's electronic technology, with high speed analog to digital encoders, has made it possible for real time processing of each Lidar pulse as it is received, and storing the product on conventional magnetic tape. Once in this format, Lidar data can be analyzed in the same manner as is done using other meteorological sensors.

The basic signal processor used with the Lidar is the Biomation Model 610B transient digitizer. Each backscatter pulse detected by the photomultiplier results in an analog output voltage that is sent to the transient digitizer for temporary storage. Linear amplifiers or signal conditioners are not used. The Model 610B converts the analog signal at a 10 MHz rate, into 256, 6-bit words using a shift register memory to capture and hold the digital equivalent of the input. When triggered to read out the stored information, the result is a smoothed function with data points at 0.1 microsecond intervals. Information stored in the 610B is recirculated in the memory circuits until updated by another input pulse. This allows time for viewing each processed pulse on an oscilloscope or strip chart recorder.

Permanent storage for each backscatter return is accomplished using a Kennedy Model 1500 incremental magnetic tape recorder. An interface, or buffer unit, between recorder and the transient digitizer is necessary for slowing the data transfer rate.

The interface module also controls the starting and stopping of the recorder. Upon receipt of a trigger command from the 610B, the interface module synchronously controls the readout of the 256 data words plus six identifier words into the magnetic tape recorder. An internal command from the 610B designates when readout from the memory is complete allowing the interface module to turn off the recorder. A small tape gap of approximately ½ inch is automatically placed between each recorded segment.

The major electronic subassemblies of the Lidar and data recording system are illustrated in the block diagram shown in Figure 3.



Power Supply
Control Elec.
Flash Lamps
Lite Mike
Laser Rod
Synchronizer
Mag Tape
Elec. Interface
A/D - S.H. 610-B
P.M.T. Detector
xxxxxxxx
Data Switches

Figure 3. Major system components

Along with each processed Lidar signal, there must be an accompanying identifying file number for systematically logging each set of data onto the tape. This is accomplished with a set of ten manually programmed control switches also connected to the interface module. Information as to day, time, position and operation number are read into the tape as each variable changes.

Preceding the readout position of the 10-digit file word is the digitized portion of the pulse energy from the laser. The design of the interface and control switches allows for the eventual insertion of a digital time clock. Presently, the day, hour, and operation number are manually set using the thumbwheel switches.

An example of the data format for the recorded information is shown in Figure 4. This information is serially placed on magnetic tape beginning with the time interval marked, and continuing until all 272 words have been transferred. The 272 words constitute the entire record length.

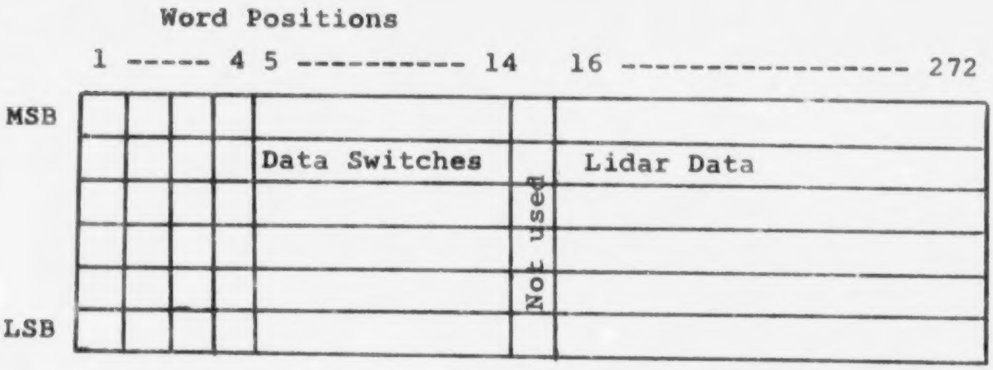


Figure 4. Recorded data format

The transferral into mag tape storage begins with the most significant byte (MSB) of each word and ends with the least significant byte (LSB). The Kennedy 1500 uses six of its seven recording tracks running at the conventional 1600 bytes/inch. An end of file or record gap is automatically inserted between each sequence of 272 words.

An example of a complete data record cycle would be as follows:

1. Laser is pulsed and threshold detector triggers 610B, preconditioning the memory.
2. Output from PMT enters the shift registers of the 610B; processed signal now begins recirculating.
3. Upon indication that digital data is present, interface

module is triggered to begin readout cycle; recorder is turned on.

4. Data switches are sampled prior to sampling information from the 610B memory.

5. Upon readout of the 272nd word, a "transmission complete" signal is passed to the interface module; recorder is turned off.

6. Processed pulse information continues to recirculate in 610B shift registers until updated -- signal is transferred to oscilloscope for monitoring.

SECTION VI

LIDAR DATA READOUT AND PROCESSING

One day of successful operation for the LARPP program will result in the storage of from 500 to 800 Lidar pulses on one reel of magnetic tape. Individually reviewing each returned backscatter pulse is possible by unpacking the magnetic tape using the format in Figure 4. This can be accomplished at any data processing facility using IBM compatible tape readout.

A generalized description of a recorded Lidar pulse might appear as in Figure 5 after processing by the 610B and transferral from the tape storage.

Time or slant range is read along the x-axis in increments of 15 meters corresponding to each data point. This is the shortest sampling interval (0.1 microsecond) allowed by the 610B and represents the limiting spatial resolution. The intensity along the y-axis is measured in arbitrary units.

The measurement of range to a discontinuity or layer is determined from the one-way time interval between the time of pulse transmission and receipt of an echo from the layer. The time of pulse transmission is visually identified from the data, as in Figure 5, as the point where the signal is deflected from the horizontal.

The mobile Lidar was operated principally at 45 degrees elevation from 5 Oct. to 11 Nov. Data recorded during this time interval was later processed with a .707 factor to account for the elevation angle when determining vertical height to a layer. The recorded data are also annotated to indicate when 45 or 90 degrees is used.

It should be noted that depression angles below 90 degrees afford the opportunity of looking through a greater thickness of haze or inversion layers. In cases where the boundary region is quite thin, the more scattering that occurs allows the discontinuity to be easily identified.

An elevated moisture layer associated with a stratus or marine layer inversion is quite common over the California coastal areas. The existence of this condition can be recognized in the raw data printout from the characteristic scattering increase associated with the moisture particulates. The signal level from just above this layer is usually at a lower magnitude from the case where no attenuation is present.

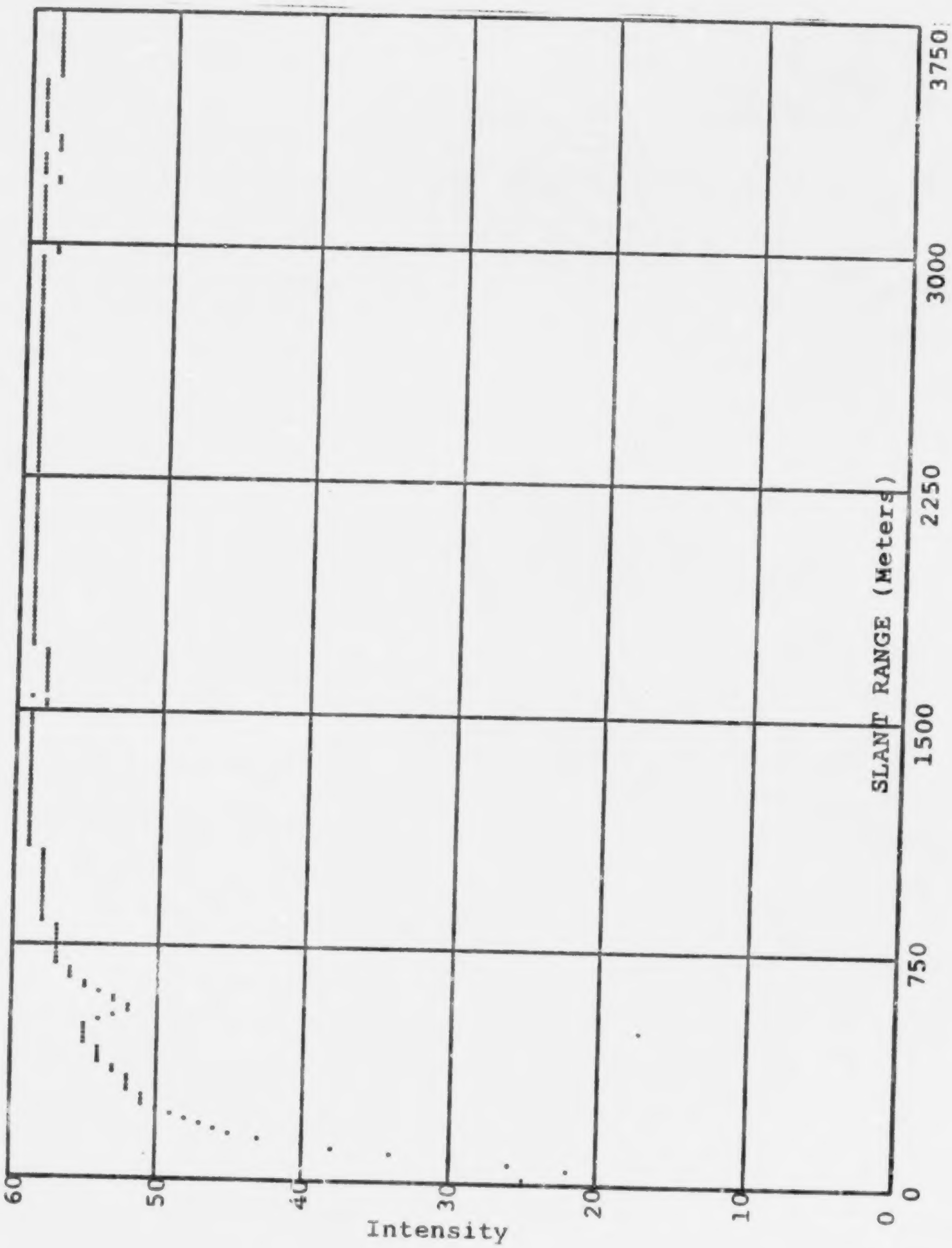


Figure 5. Example of digital printout from data tape

Profiles such as that shown in Figure 5 are related to temperature or moisture data, with variation in turbidity corresponding to thermal inversion. Lidar data obtained during the LARPP program, shown in the next section, are also compared in this way.

NUMERICAL DATA SUMMARY

The primary data tape, as previously described, contains the digitized analog signals direct from the Lidar receiver, unprocessed with regard to inversion heights, cloud decks, or mixing layer depth. Signals recorded are not normalized for power fluctation and contain the usual $1/R^2$ dependence. A second processed tape has been prepared which provides a numerical interpretation for each of these features in terms of altitudes of significant layers and approximate mixing depth.

The criteria used in identifying the echo anomalies can be quite complicated, often requiring the computation of extinction values along the entire path. This is especially true if only automatic data processing methods are used in the identification process. What is being attempted in the processed tape is a classification of the echo anomaly into mixing layer height or significant levels based on a backscatter slope evaluation.

A difference in air mass, as encountered near an inversion top, would be represented as a change in the rate of signal extinction given by dP/dR. A significant increase or decrease in dP/dR is indicative of the transition between different air masses. Consequently, the rate of change in the slope dP/dR, or $(d/dR)\left[(dP)/(dR)\right]$ will vary from (+) to (-) when encountering this discontinuity in air mass. The mixing height is established in this instance when $(d/dR)\left[(dP)/(dR)\right]$ changes from (+) to (-) when analyzed over three or more data points. A change in slope $(dP)/(dR)$ from negative (-) to positive (+) is representative of an aerosol or moisture layer, but these are termed "significant levels" as they are usually found at or below the air mass discontinuity.

A scattering medium having a high attenuation, such as characterized by a fog or haze, is manifested in the Lidar return as having a rapid signal falloff within the near field region (50 to 300 meters). As the laser pulse penetrates through this region of turbidity into a clear drier region above, the backscatter slope changes in magnitude until finally diminished by the $1/R^2$ factor. This would be classified as the upper mixing layer boundary unless a second slope anomaly is found at a higher altitude. The numerical routine for analyzing the backscatter profiles uses a least square fit for smoothing the data points and computes a dP/dR over each 15 meter range increment. A nearly constant slope is expected for the 50 to 300 meter near-field range, with any departures being recorded as a significant level. Reversals in sign, from either positive or negative, indicate the presence of a discontinuity or more commonly a cloud or moisture layer. These can also be separately identified but are here classified as a significant level. In most all cases examined, the mixing layer has been shown to be associated with the region below the temperature inversion base but may sometimes extend upward into the inversion when the temperature gradient is weak.

All raw data tapes were examined using the numerical analysis methods and recorded in tabular form. The output format for these tapes appear as in Figure 6.

Organization is accomplished using operation number and date as the identifying code.

RANGE NORMALIZED SIGNAL RETURNS

The processed data summary contained in the initial output tapes may be considered a generalized result based on the morphology of typical Lidar backscatter returns. The qualitative aspects of each backscatter signature are used in identifying the nature and altitude of inversion bases, moisture layers, stratus and fog layers. A second iteration of the basic data, involving a numerical analysis, is needed to remove the influences of range dependence.

Removing the influence of power fluctuations and daily extinction variances is done through a normalization procedure. Utilized in this processing is a computer subroutine for generating a five-degree polynomial to fit the Lidar raw data. This subroutine is one locally available and known as BMD05R in many of the Fortran libraries. It essentially computes successive degrees of polynomial regression (from first degree to k^{th} degree, $1 \le k \le 10$) for a set of input data consisting of values of one independent and one dependent variable. Optimal computations and output are a table of residuals, a plot of the given values and a superimposed plot of the values predicted by the regression equation.

DATA TAPE FORMAT

Identification Code			Lidar Inclination Angle	Case No.	Significant Levels	Mixing Layer Height
Run No.	Time	Location Coordinates				
12	3456	7890	45	1	60m	400m
			45	2		
				3		
				4		

Figure 6. Tape format for numerical data summary

The Lidar data shown in Figure 5 before processing is repeated in Figure 7 following the normalization procedure. The "residual" contains information on extinction or backscatter changes separate from the usual effects of beam divergence within the near field region. Some degree of graininess appears which unfortunately is due to the temporal resolution qualities of the transient digitizer. Further smoothing of the residual plot is possible before proceeding to remove the $1/R^2$ function. The smoothed residual can also be incorporated in a three-dimensional plot of a sequence of daily observations that would provide a visual recognition of the time-dependent nature of the meteorological features.

The backscatter signals returned to the PMT detector are dependent in magnitude on the range at which the signal echoes originate away from the receiver. This is the usual $1/R^2$ relationship inherent in radar signal processing. The signal magnitude from two identical targets will appear different in the data according to their respective range from the receiver.

The preferred method for providing signal conditioning is similar to that used in radar technology, whereby a preamplifier stage, following the detector, introduces a programmable range selectable gain. Without having these hardware components available at the onset of the LARPP project, it was decided to employ software processing following all data collection. Essentially, a normalization process would be applied to the data that is derived from the physical parameters in the Lidar range equation.

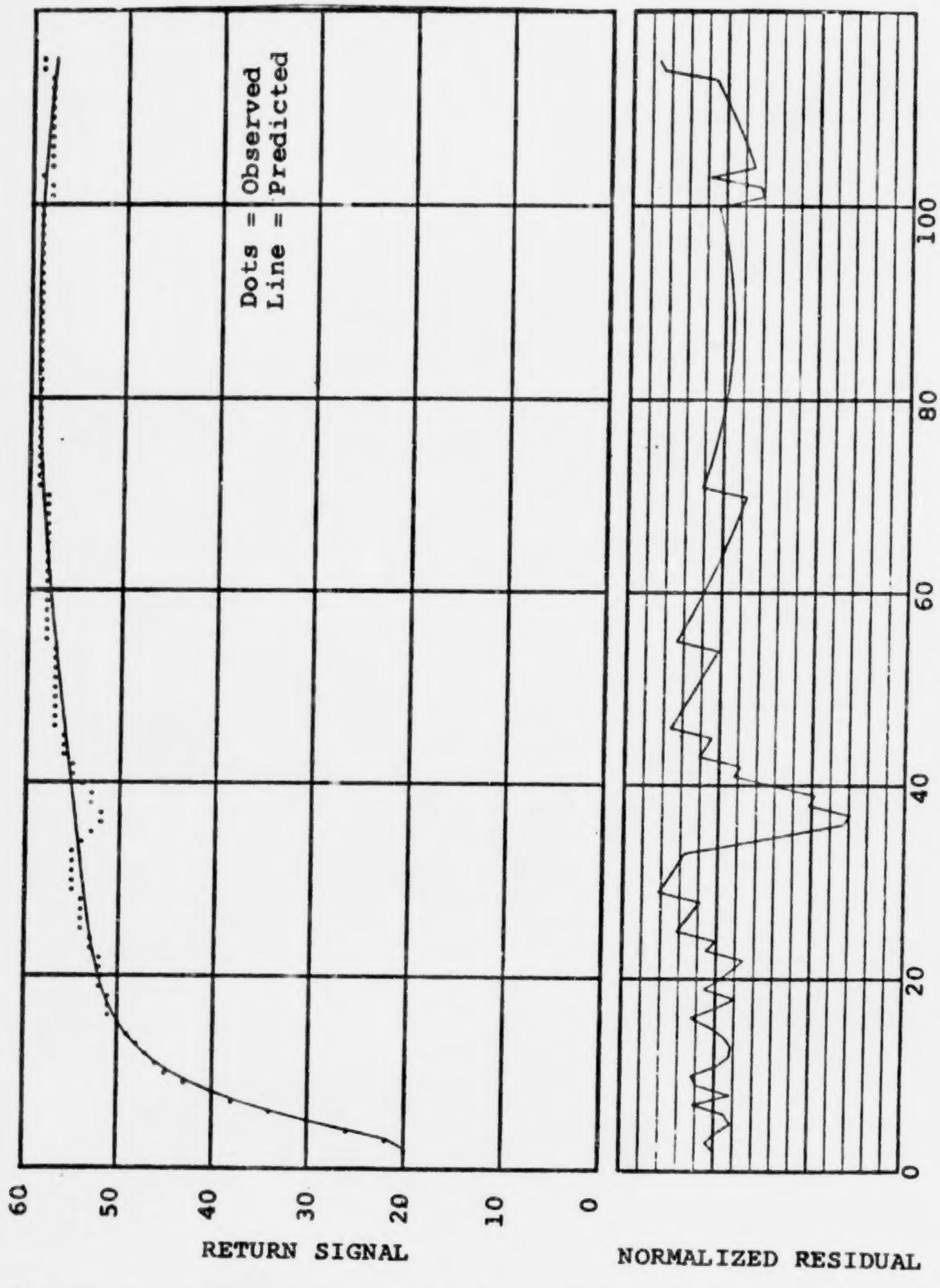


Figure 7. Polynomial fit to data with normalized residual

SECTION VII

DISCUSSION OF THE OBSERVED LIDAR DATA

MOBILE LIDAR MISSION DAY - 10/5/73

The humidity trace on the early morning (0532 PDT) radiosonde release data clearly showed the upper boundary of a low level stratus layer to be approximately 357 meters. Ground haze and fog also persisted throughout the coastal areas of the Los Angeles basin until late afternoon. Coincident with the altitude of the stratus tops was a temperature inversion approximately 357 meters above the ground level. This inversion base was observed to move up to 638 meters later in the day as indicated by the 1210 PDT radiosonde release.

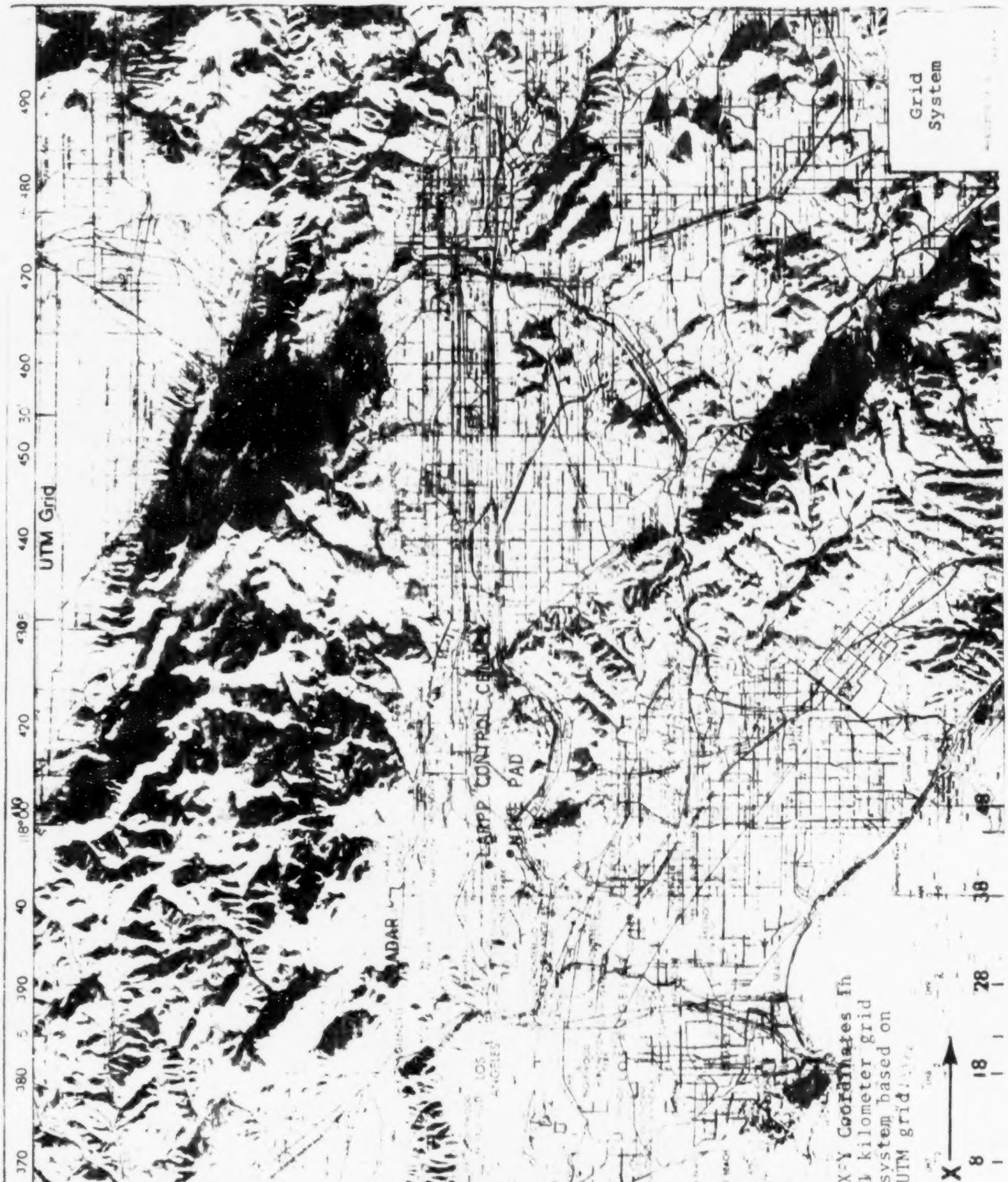
Lidar returns taken from the Downey release site between 0730 and 1155 also showed the predominant stratus base beginning at approximately 126 to 145 meters during the early morning. Overall weather conditions persisted but occasional breaks in the stratus deck allowed Lidar signal penetration sufficiently well to define the upper surface. The upper surface altitude varied between 300 and 500 meters from 0730 to 1100 which corresponded extremely well with the humidity gradient recorded with the radiosonde. The Lidar signal attenuation usually encountered during days of fog and stratus, significantly reduces the signal intensity from any levels beyond the stratus top. Under certain circumstances a very dense fog or stratus will limit the laser beam penetration to several hundred feet within the medium. This was not the case for October 5, however, as the characteristic backscatter echoes were correlated to the uppermost boundary.

The reported rise in the inversion base was noted from the Lidar echoes returned from the tops of the thick moisture layers near 525 meters at 1200 PDT. Proceeding with the Lidar van to the northeast later in the day, the levels were found to decrease somewhat.

All the supportive synoptic and meteorological data for each of the mission days are presented in the Appendixes A through F. The radiosonde data and the weather information in the Los Angeles basin were obtained from the Air Pollution Control District of Los Angeles County and the U.S. Weather

Service. A summary of the comparison of the Lidar mixing layer height with the meteorological observations is presented for each mission day. The temporal variations of the observed Lidar mixing layer heights are tabulated along with the meteorological data taken at the launch site, LAX and El Monte Stations. An overall Mobile Lidar Mission Summary is presented on Chart 2. A daily Lidar operation summary is presented preceding the mobile Lidar route map for each mission day. The coordinate grid system of the Los Angeles basin is presented for reference on the following page. A graphical presentation of the temporal and spatial variations of the mixing layer height along the observational route for each mission day is also shown.

Reproduced from best available copy.


Grid System
UTM Grid
370
380
390
400
410
420
430
440
450
460
470
480
490
RADAR
LIPP CONTROL CENTER
NIKE PAD
LOS ANGELES
REDONDO BEACH
X-Y Coordinates in 1 kilometer grid system based on UTM grid.
Y
X
0
8
18
28
38
48
13
23
33
43
53
63
73
83
93
UTM Grid

Grid system

Chart 2. MOBILE LIDAR MISSION SUMMARY

Mission date 1973	Launch		Observation	
	Site	Time	Start time	End time
10/5	J	1200	0704	1512
10/10	J	0830	0800	1505
10/11	A	0800	0755	1259
10/12	A	0930	0856	1436
10/15	J	0940	0725	1440
10/16	A	1315	1213	1534
10/17	A	0930	0930	1617
10/18	J	0915 (1)	0802	
	J	1135 (2)		1440
10/24	J	0900	0800	1318
10/25	A	0845	0740	1426
10/26	A	1000	0850	1560
10/27	A	0900	0758	1237
10/29	J	0830	0725	1319
10/30	J	0830	0731	1105
10/31	A	0830	0745	1056
11/1	A	0742 (1)	0625	
	A	1145 (2)		1406
11/2	J	1151	0925	1412
11/5	J	0715	0659	1440
11/6	A	0735 (1)	0630	
	A	1105 (2)		1323
11/7	A	0830	0749	1417

Site J - Downey
Site A - Los Angeles

(1) - First launch
(2) - Second launch

Chart 3. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 1 10/5/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600					357	997	467	>600	0.5	378	749	457	570	
0700	320	380	320	380					0.5					
0800									1.0					400-450
0900									1.0					350-400
1000									1.0					275-350
1100									1.8					400-500
1200					638	1086	638	687	2.0					400-500
1300									2.5	597	969	649	969	400-500
1400									2.5					300-400
1500									3.0					275-325
1600														

NOTE I_b Inversion base (meters)

I_t Inversion top (meters)

DP_b Lower altitude of gradient change in dewpoint (meters)

DP_t Upper altitude of gradient change in dewpoint (meters)

Vsb Visibility at the surface (miles)

MLH Mixing layer height (meters)

Chart 4. SUMMARY OF OPERATION

MISSION DAY 10/5/73

	LIDAR		L.A. BASIN GRID POSITION COORDINATES		
TIME	ON	OFF	X	Y	REMARKS
0600					Left Lidar Base
0704			31	47	Launch site "J" Downey
0836	*		"	"	
0913	*		"	"	
0914	*		"	"	
1000	*		"	"	
1036	*		"	"	
1100	*		"	"	
1130	*		"	"	
1155	*		"	"	
1200			"	"	Launch
1233	*		29	52	Long Beach Fwy. & Florence Ave., Bell.
1241	*		"	"	
1338	*		33	66	Long Beach Fwy. 7 to San Bernardino Fwy. 10 to Atlantic. North to Main St. in Alhambra.
1340	*		"	"	
1341	*		"	"	
1425	*		34	73	North on Atlantic, up Los Robles to E. Orange Grove & turn east to Lake in Pasadena.
1457	*		40	"	Sierra Madre
1510	*		42	"	Continued east on E. Orange Grove 1¼ miles. Sierra Madre.
1511	*		"	"	
1512	*		"	"	
1745					Arrived @ Lidar Base.

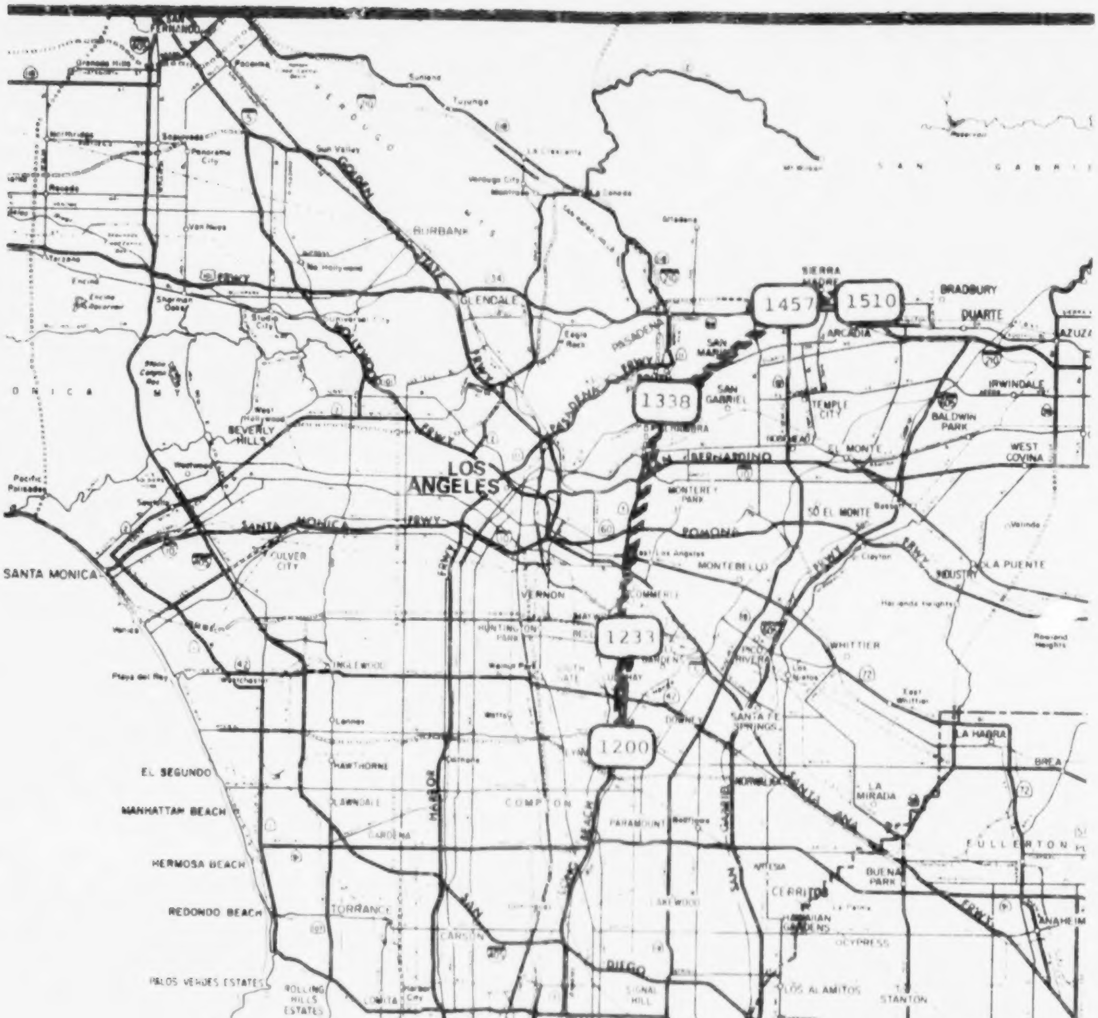

1457
1510
1338
1233
1200
SIERRA MADRE
BRADBURY
DUARTE
ARCADIA
AZUZA
SAN MARINO
SAN GABRIEL
TEMPLE CITY
IRWINDALE
BALDWIN PARK
EL MONTE
WEST COVINA
ALHAMBRA
SAN BERNARDINO
MONTEREY PARK
SO EL MONTE
POMONA
MONTEBELLO
LA PUENTE
INDUSTRY
WHITTIER
PICO RIVERA
SANTA FE SPRINGS
LA HABRA
BREA
LA MIRADA
FULLERTON
BUENA PARK
ANAHEIM
CERRITOS
HAWAIIAN GARDENS
CYPRESS
LOS ALAMITOS
STANTON
GARDEN GROVE
WESTMINSTER
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA
SAN FERNANDO
BURBANK
GLENDALE
PASADENA
LOS ANGELES
BEVERLY HILLS
SANTA MONICA
CULVER CITY
VERNON
HUNTINGTON PARK
COMMERCE
DOWNEY
INGLEWOOD
HAWTHORNE
LAWNDALE
GARDENA
COMPTON
PARAMOUNT
LAKEWOOD
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
TORRANCE
CARSON
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
ROLLING HILLS
SIGNAL HILL
LONG BEACH
SAN GABRIEL
Scale in Miles

Figure 8. Mobile Lidar route map
Mission day 10/5/73

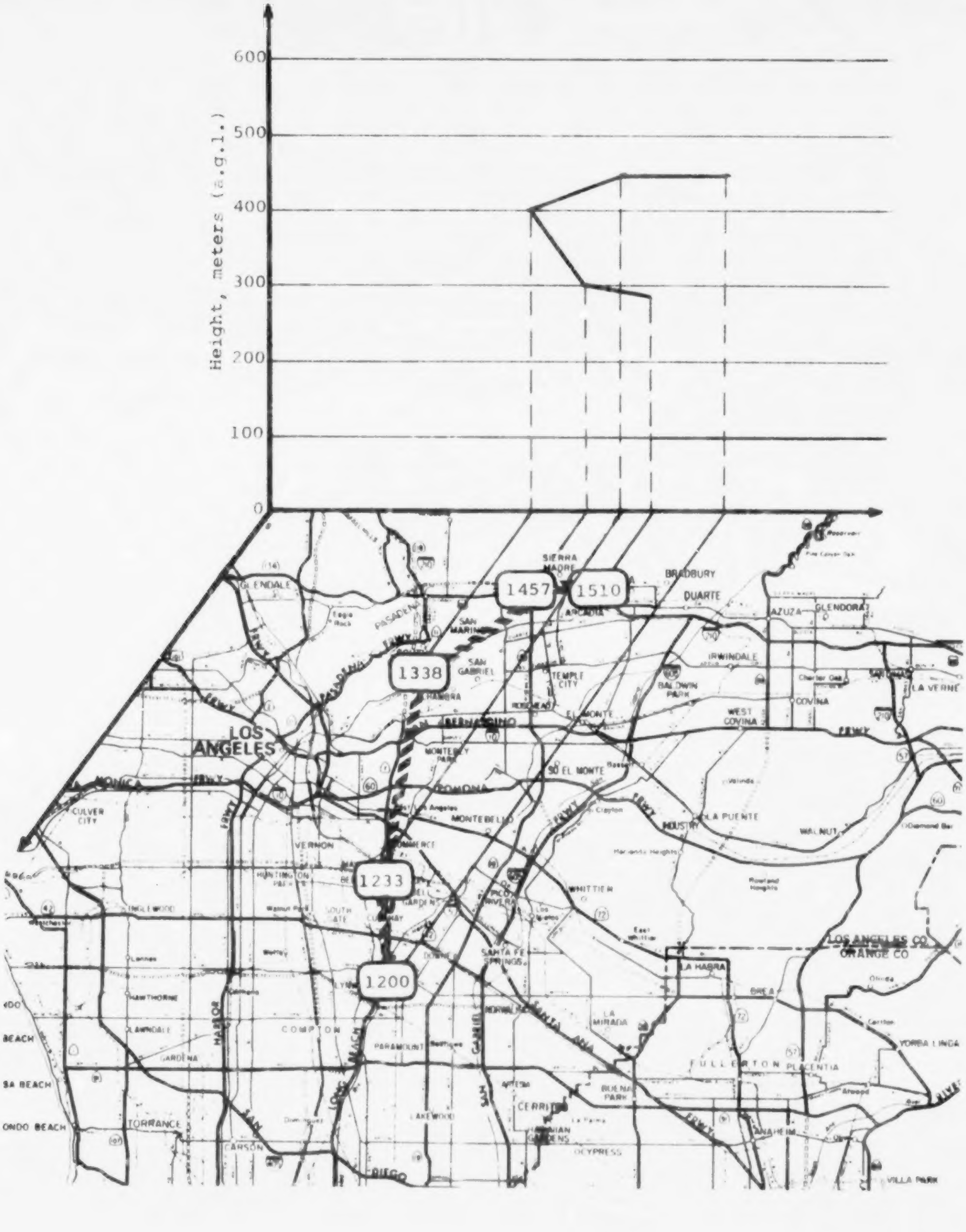


Figure 9. Mixing layer height along observational route Mission day 10/5/73

MISSION DAY - 10/10/73

Lidar returns taken in the early morning near Downey indicated the presence of moisture-laden particulates aloft extending to about 610 meters altitude at 0820 PDT. The variability in height of the backscatter levels in the Lidar data are possibly indicative of a weak temperature gradient existing from a ground-based inversion.

Radiosonde data from 0542 PDT showed an inversion top at approximately 598 meters along with a sharp reduction in moisture content in the air above 598 meters. A stronger inversion developed after mid-morning when the reported base was 226 meters and top was 287 meters. By 12 noon, the Lidar data revealed mixing depth to be approximately 213 to 305 meters above the surface over the Fullerton/Anaheim area.

Local weather was clear skies by 1100 PDT along with a reduction in absolute moisture above 287 meters. Throughout the distance traveled from Downey to the Orange Freeway in Fullerton, backscatter from the inversion base altitude fluctuated over a 168 meter range indicating some variability in space and time. High peak values in the mixing depth near Pomona and Orange Freeway possibly indicated strong vertical mixing produced by air parcel heating from high ground temperatures. Wind conditions were generally mild (6-12 kts) throughout the afternoon. The average mixing depth remained about 274 meters throughout the afternoon.

Chart 5. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 2 10/10/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600					Sfc	598	287	406	4.0	Sfc	707	408	707	
0700	400	450	N.A.	N.A.					4.0					
0800									6.0					400-600
0900									10					200-250
1000									12					200-400
1100									20					150-250
1200					226	287	83	287	25	Equipment Failure				200-300
1300									25					200-300
1400									25					
1500									25					200-250
1600														

NOTE
I_b Inversion base (meters)
I_t Inversion top (meters)
DP_b Lower altitude of gradient change in dewpoint (meters)
DP_t Upper altitude of gradient change in dewpoint (meters)
Vsb Visibility at the surface (miles)
MLH Mixing layer height (meters)

Chart 6. SUMMARY OF OPERATION

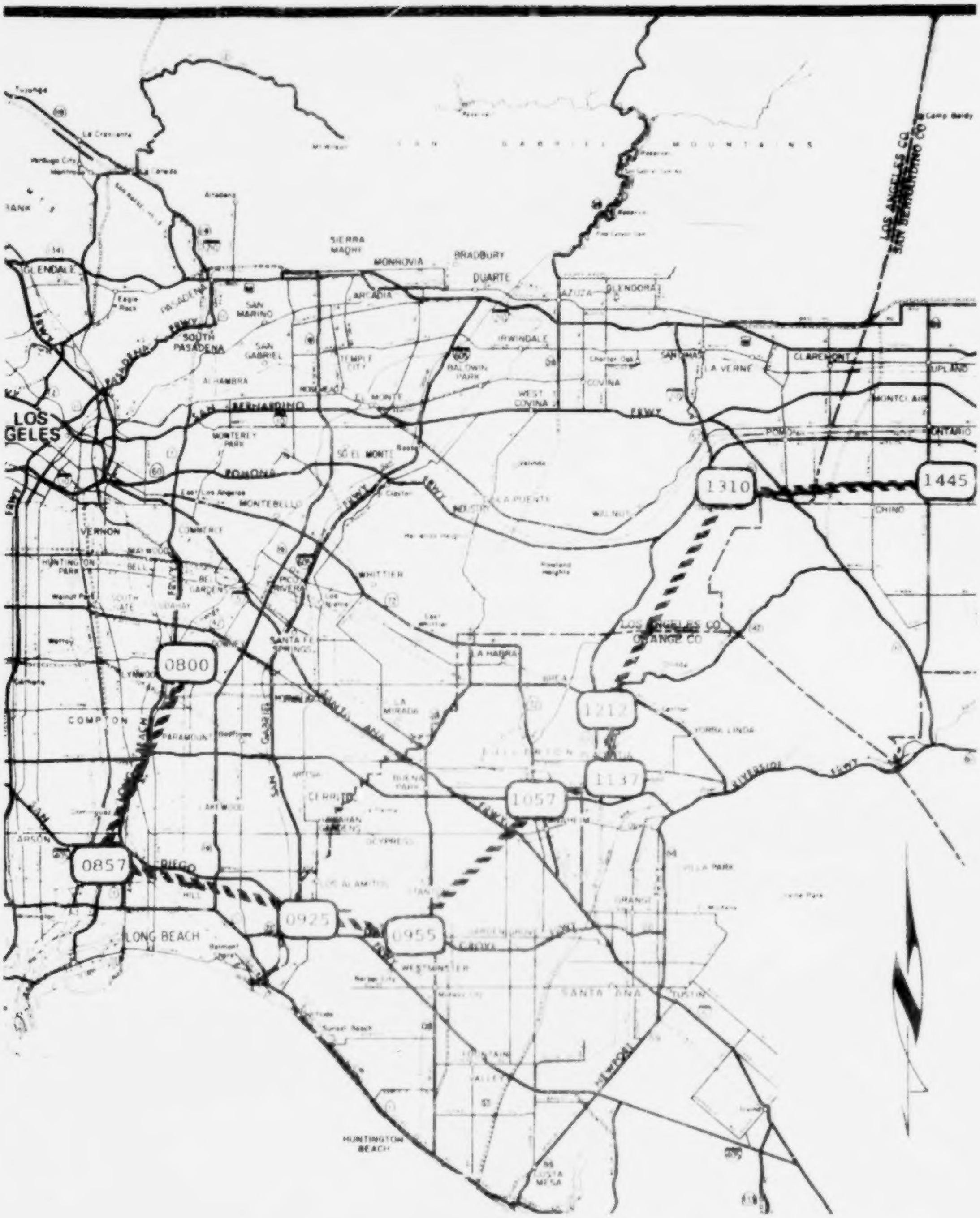
MISSION DAY 10/10/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	Y	
0645					Left Lidar Base
0800			31	47	Arrived @ Launch site "J" Downey.
0823	*		"	"	
0830	*		"	"	Launch
0857	*		26	36	South on Long Beach Fwy. 7 to Wardlow in Long Beach.
0900	*		"	"	
0905	*		"	"	
0908	*		"	"	
0910		*	"	"	
0925			37	31	South on San Diego Fwy. 405 to Seal Beach Blvd. in Seal Beach.
0930	*		"	"	
0931	*		"	"	
0935	*		"	"	
0937	*		"	"	
0941	*		"	"	
0945		*	"	"	
0955			45	30	South on San Diego Fwy. 405 to Garden Grove Fwy. 22 to Knott offramp in Garden Grove.
0957	*		"	"	
1000	*		"	"	
1005	*		"	"	
1008	*		"	"	
1011	*		"	"	
1013		*	"	"	
1053			46	41	East on Garden Grove Fwy. to Beach 39, North to Santa Ana Fwy. 5 in Buena Park.
1057			52	39	South on Santa Ana Fwy. 5, East on Riverside Fwy. 91 to Harbor offramp in Fullerton. East on Riverside Fwy. to Orange Fwy. 57.
1108	*		"	"	
1110	*		"	"	
1116	*		"	"	
1119	*		"	"	
1124	*		"	"	

Chart 6 (continued). SUMMARY OF OPERATION

MISSION DAY 10/10/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	X	REMARKS
1127	*		52	39	
1129		*	"	"	
1139	*		57	57	Just South of Placentia.
1147	*		"	"	
1153	*		"	"	
1200	*		"	"	
1203		*	"	"	
1220	*		57	46	North on Orange Fwy. 57 to Imperial offramp in Fullerton.
1224	*		"	"	
1233	*		"	"	
1237	*		"	"	
1244	*		"	"	
1248		*	"	"	
1310			63	58	North on Orange Fwy. 57, East on Pomona Fwy. 60 and off at Diamond Bar.
1315	*		"	"	
1322	*		"	"	
1323	*		"	"	
1337		*	"	"	
1445	*		86	58	East on Pomona Fwy. 60 to Milliken offramp due South of Ontario Motor Speedway.
1453	*		"	"	
1457	*		"	"	
1503	*		"	"	
1505		*	"	"	
1900					Arrived @ Lidar Base



SAN GABRIEL MOUNTAINS
LOS ANGELES CO
SAN BERNARDINO CO
Camp Baldy
GLENDALE
PASADENA
SOUTH PASADENA
SIERRA MADRE
MONROVIA
BRADBURY
DUARTE
ARCADIA
SAN MARINO
SAN GABRIEL
ALHAMBRA
TEMPLE CITY
EL MONTE
BALDWIN PARK
IRWINDALE
AZUSA
GLENDORA
COVINA
WEST COVINA
SAN DIMAS
LA VERNE
CLAREMONT
UPLAND
MONTCLAIR
ONTARIO
POMONA
CHINO
LOS ANGELES
MONTEREY PARK
SAN BERNARDINO FRWY
POMONA FRWY
MONTEBELLO
VERNON
COMMERCE
HUNTINGTON PARK
BELL
MAYWOOD
BELL GARDENS
SOUTH GATE
PICO RIVERA
WHITTIER
SANTA FE SPRINGS
LA PUENTE
WALNUT
LA HABRA
LA MIRADA
BREA
LOS ANGELES CO
ORANGE CO
YORBA LINDA
RIVERSIDE FRWY
COMPTON
PARAMOUNT
LONG BEACH FRWY
SAN GABRIEL RIVER FRWY
ARTESIA
CERRITOS
BUENA PARK
LAKEWOOD
HAWAIIAN GARDENS
CYPRESS
LOS ALAMITOS
FULLERTON
ANAHEIM
SANTA ANA FRWY
VILLA PARK
ORANGE
CARSON
SAN DIEGO
LONG BEACH
WESTMINSTER
GARDEN GROVE
SANTA ANA
TUSTIN
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA
NEWPORT FRWY
0800
0857
0925
0955
1057
1137
1212
1310
1445

Figure 10. Mobile Lidar route map
Mission day 10/10/73

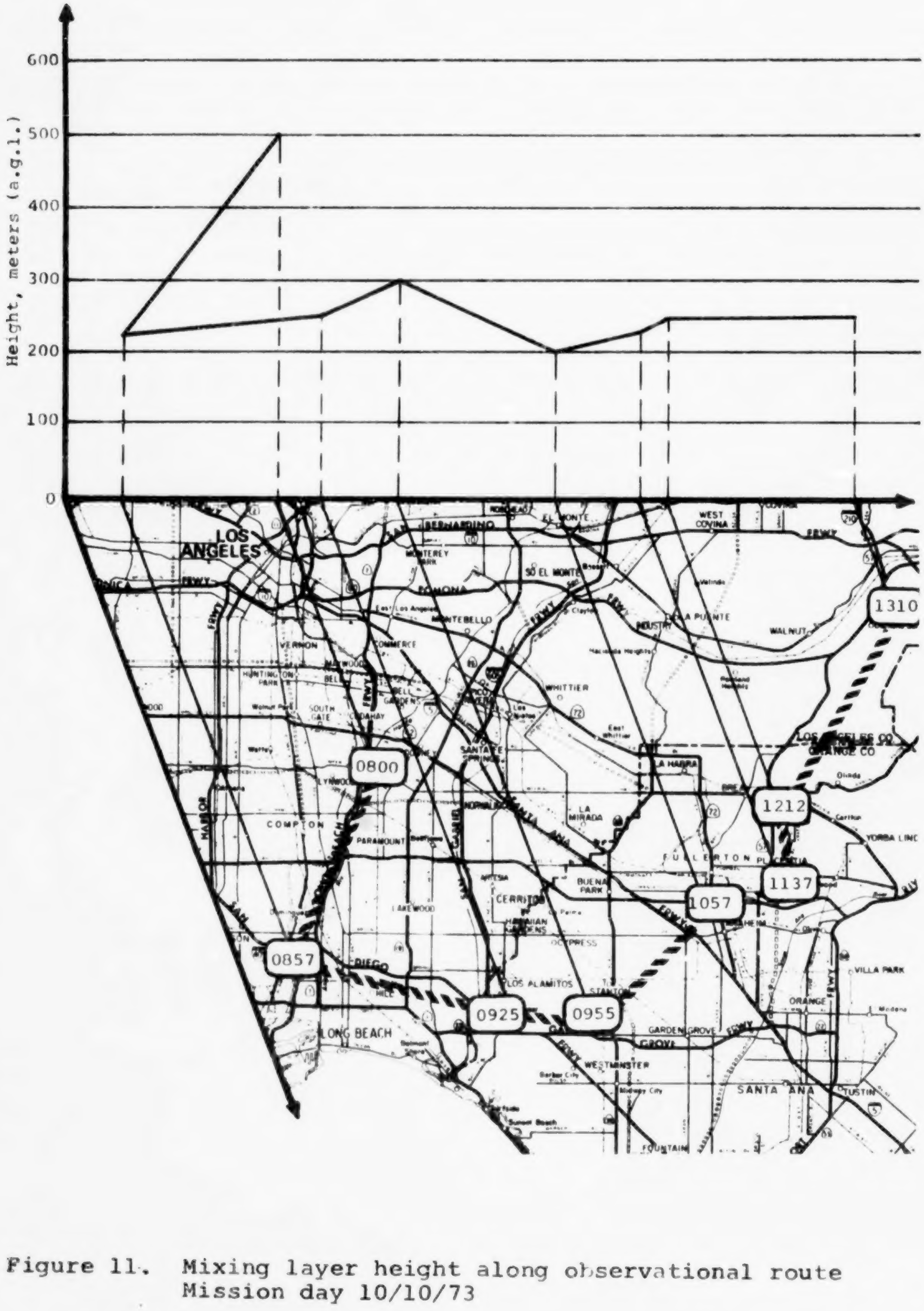


Figure 11. Mixing layer height along observational route Mission day 10/10/73

MISSION DAY - 10/11/73

The meteorological conditions on the 11th represented a day of significant contrasts beginning with stable temperature lapse condition at 0700 PDT and changing to unstable conditions in late morning (1100 PDT). An elevated haze layer was indicated from visual observations made at the launch site, which was verified by the existence of a weak upper level temperature inversion between 226 and 418 meters. The late morning, 1100 PDT, radiosonde release showed this condition to have disappeared and an overall neutral temperature profile to evolve.

Lidar returns recorded at the launch site between 0750 and 0820 PDT revealed the existence of a 100 meter thick layer beginning at approximately 320 meters above the surface. During the next two hours, weak echoes signifying another interface were occasionally observed above this altitude although no comparable evidence was found from the radiosonde profiles.

Beginning with the 0845 PDT Lidar returns, a breakup of the layered structure was manifested by random echoes occurring at various altitudes. It is probable that during that time, a shift to neutral temperature condition occurred.

Minor maintenance problems during the morning temporarily deferred taking Lidar data from 0950 to 1155 PDT. Resuming Lidar operation, this time in the Malibu foothills, a different layering was discovered. Most likely this layering at 440 to 525 meters (a.g.l.) represents the orographic uplifting presented to the onshore marine particulates by the Malibu cliffs.

Chart 7. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 3 10/11/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600	Sfc	390	none		Sfc	168	Sfc	67	12	Sfc	637	none		
0700									10					300-400
0800									5					300-400
0900									5					175-300
1000									5					N.A.
1100									4					N.A.
1200					none		none		5	none		none		400-500
1300									6					400-500
1400									12					
1500									14					
1600														

NOTE	I_b	Inversion base (meters)
	I_t	Inversion top (meters)
	DP_b	Lower altitude of gradient change in dewpoint (meters)
	DP_t	Upper altitude of gradient change in dewpoint (meters)
	Vsb	Visibility at the surface (miles)
	MLH	Mixing layer height (meters)

Chart 8. SUMMARY OF OPERATION

MISSION DAY 10/11/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	Y	
0600					Left Lidar Base
0755	*		24	59	Launch site "A" Downtown L.A.
0759	*		"	"	
0803	*		"	"	
0804	*		"	"	
0807	*		"	"	
0811	*		"	"	
0815	*		"	"	
0820		*	"	"	
0845	*		6	59	West on Santa Monica Fwy. 10 to San Diego Fwy. 405 in West Los Angeles.
0849	*		"	"	
0850		*	"	"	
0856	*		"	"	
0858	*		"	"	
0859		*	"	"	
0927	*		0	57	Continued on Santa Monica Fwy. to the ocean in Santa Monica.
0934	*		"	"	
0940	*		"	"	
0943	*		"	"	
0945		*	"	"	
1027					Arrived @ Apollo for checkup.
1155	*		16	59	North on Pacific Coast Hwy. 1 to Malibu, Pepperdine College.
1200	*		"	"	
1201		*	"	"	
1206	*		"	"	
1213	*		"	"	
1218	*		"	"	
1224	*		"	"	
1244	*		"	"	
1253	*		"	"	
1259		*	"	"	

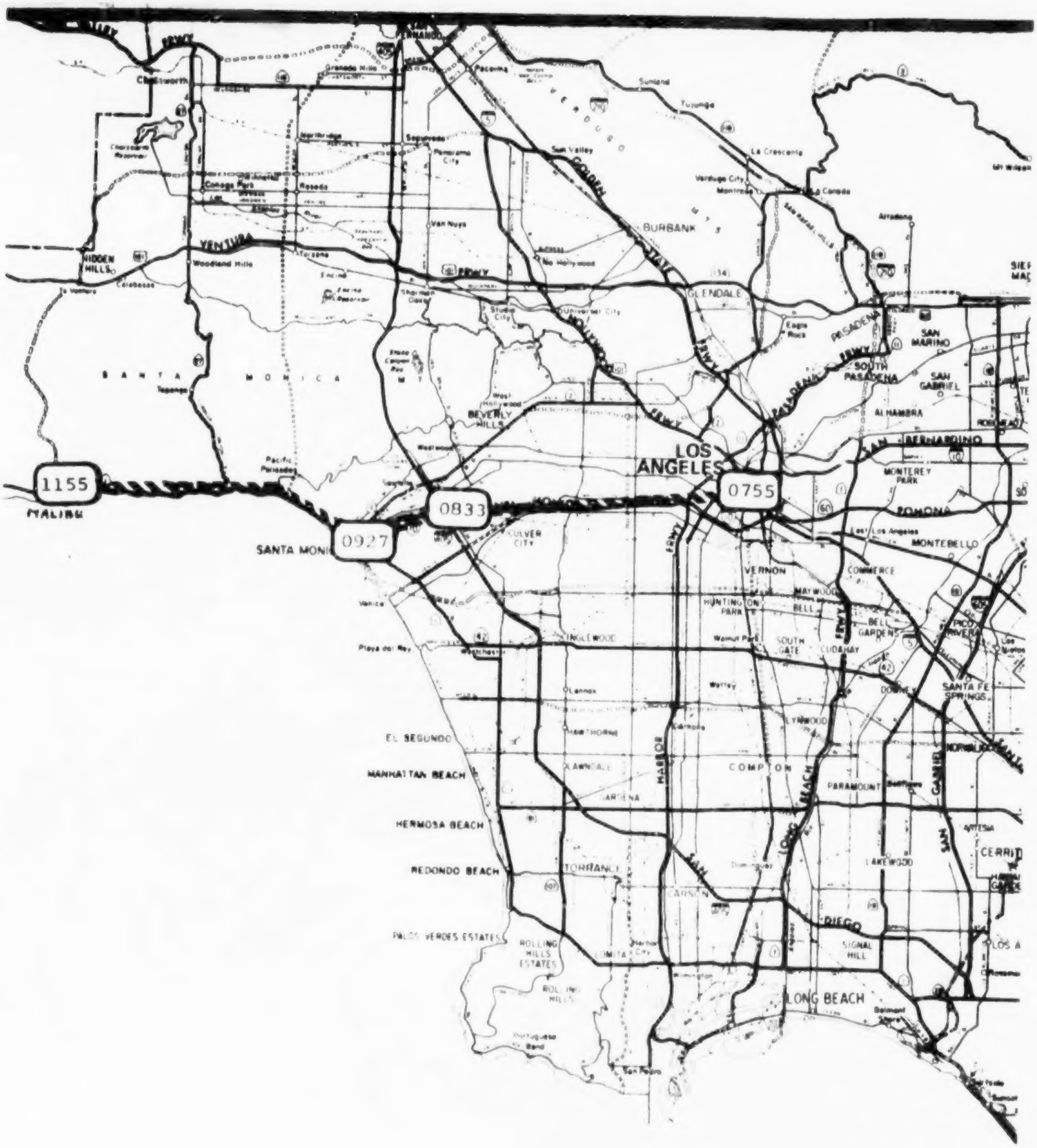

1155
MALIBU
0927
SANTA MONICA
0833
0755
LOS ANGELES
BURBANK
GLENDALE
PASADENA
SOUTH PASADENA
SAN MARINO
SAN GABRIEL
ALHAMBRA
MONTEREY PARK
MONTEBELLO
COMMERCE
VERNON
HUNTINGTON PARK
MAYWOOD
BELL
BELL GARDENS
SOUTH GATE
CUDAHAY
DOWNEY
SANTA FE SPRINGS
LYNWOOD
COMPTON
PARAMOUNT
LAKEWOOD
ARTESIA
CERRITOS
SIGNAL HILL
LONG BEACH
CARSON
TORRANCE
GARDENA
LAWNDALE
HAWTHORNE
INGLEWOOD
CULVER CITY
BEVERLY HILLS
HIDDEN HILLS
SANTA MONICA MTS
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
ROLLING HILLS
VENTURA FRWY
GOLDEN STATE FRWY
PASADENA FRWY
SAN BERNARDINO
POMONA
HARBOR FRWY
LONG BEACH FRWY
SAN DIEGO
SAN GABRIEL RIVER

Figure 12. Mobile Lidar route map
Mission day 10/11/73

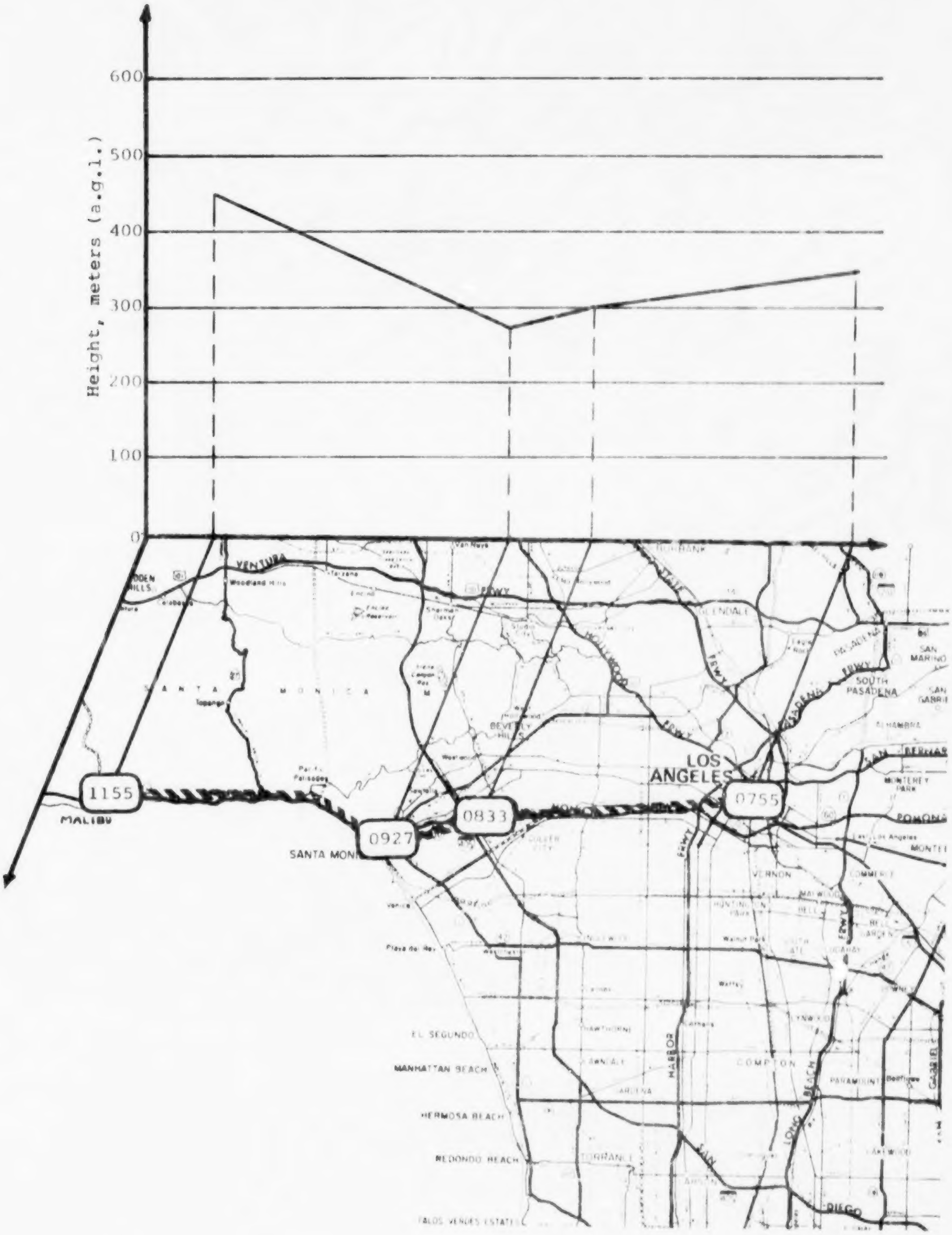


Figure 13. Mixing layer height along observational route Mission day 10/11/73

MISSION DAY - 10/12/73

A moderate to thick upper level haze persisted along the coastal areas throughout most of the day. Skies were generally free of clouds. An early morning ground-based inversion with tops around 598 meters kept this moist air trapped within the L.A. basin. A definite moisture gradient was noted in the early morning sounding beginning at 318 meters. By the time of the 1130 PDT radiosonde release, the inversion temperature base had risen to 397 meters with a 687 meter top. A lower humidity content was also reported inland near Burbank, indicating a horizontal moisture gradient existed between the coastal areas and the foothills.

Lidar data taken at the downtown L.A. launch site revealed a lower level haze and fog indicated by severe attenuation of the backscatter signal. A slight layer penetration was indicated on each return between 0930 to 1000 PDT with the probable tops occurring at about 412 meters. The indicated decrease in backscatter content at this altitude directly supports the fact that fewer water particulates were available to provide scattering.

The Lidar observing location near midday was at a significantly higher altitude (500 meters) than previously, and subsequently the layers detected were somewhat higher than before.

Chart 9. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 4 10/12/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600					Sfc	598	318	437	4	Sfc	728	none		
0700	50	490	none						4					
0800									3					
0900									3					350-450
1000									3					none
1100									4					450-550
1200					397	687	397	467	5	Equipment Failure				450-550
1300									12					200-300
1400									12					
1500									12					
1600														

NOTE		
	I_b	Inversion base (meters)
	I_t	Inversion top (meters)
	DP_b	Lower altitude of gradient change in dewpoint (meters)
	DP_t	Upper altitude of gradient change in dewpoint (meters)
	Vsb	Visibility at the surface (miles)
	MLH	Mixing layer height (meters)

Chart 10. SUMMARY OF OPERATION

MISSION DAY 10/12/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	Y	
0715					Left Lidar Base
0856			24	60	Launch Site "A" Downtown L.A.
0918	*		"	"	
0924	*		"	"	
0927	*		"	"	
0930	*		"	"	Launch
0935	*		"	"	
0938	*		"	"	
0942	*		"	"	
0943	*		"	"	
0949	*		"	"	
0957	*		"	"	
0959	*		"	"	
1003	*		"	"	
1004		*	"	"	
1123	*		2	70	West on Santa Monica Fwy. 10 to San Diego Fwy. 405, North to Mulholland Drive.
1124	*		"	"	
1143	*		"	"	
1202	*		"	"	
1222	*		"	"	
1224	*		"	"	
1235	*		"	"	
1240		*	"	"	
1258	*		5	73	North on San Diego Fwy. 405, East on Ventura Fwy. 101 to Van Nuys Blvd. in Sherman Oaks.
1259	*		"	"	
1302	*		"	"	
1318	*		"	"	
1328	*		"	"	
1335	*		"	"	
1336		*	"	"	
1417			10	79	East on Ventura Fwy. 101, North on Hollywood Fwy. 170, East on Sherman Way, North on Lankershim Way to Saticoy in Sun Valley.
1420	*		"	"	
1421	*		"	"	
1436		*	"	"	
1845					Arrived @ Lidar Base

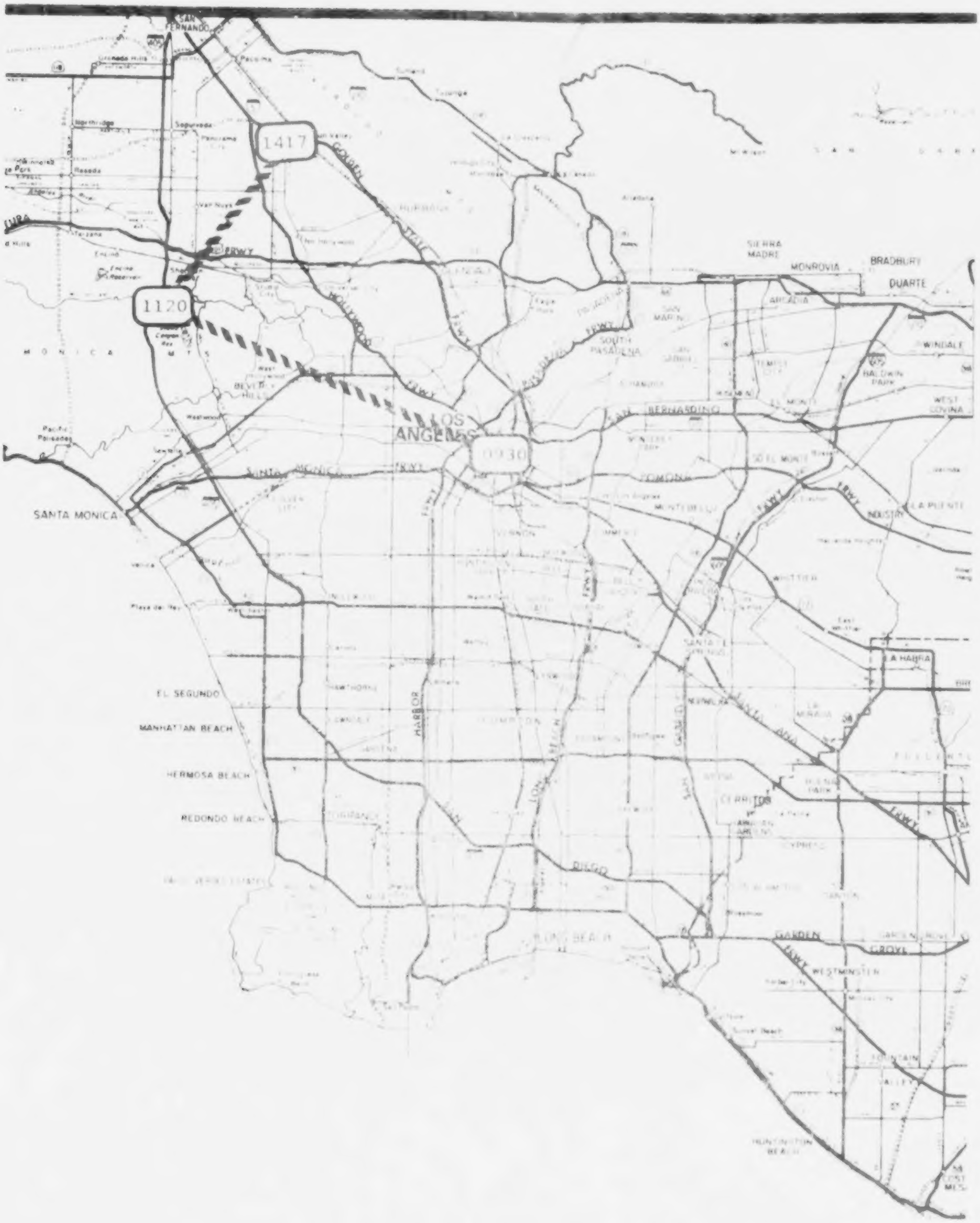

1417
1120
0930
SAN FERNANDO
LOS ANGELES
SANTA MONICA
BEVERLY HILLS
SOUTH PASADENA
SIERRA MADRE
MONROVIA
BRADBURY
DUARTE
ARCADIA
BALDWIN PARK
WEST COVINA
WHITTIER
LA HABRA
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
LONG BEACH
CERRITOS
GARDEN GROVE
WESTMINSTER
HUNTINGTON BEACH
FRWY
SANTA MONICA FRWY
SAN BERNARDINO
POMONA
HARBOR
SANTA ANA FRWY

Figure 14. Mobile Lidar route map
Mission day 10/12/73

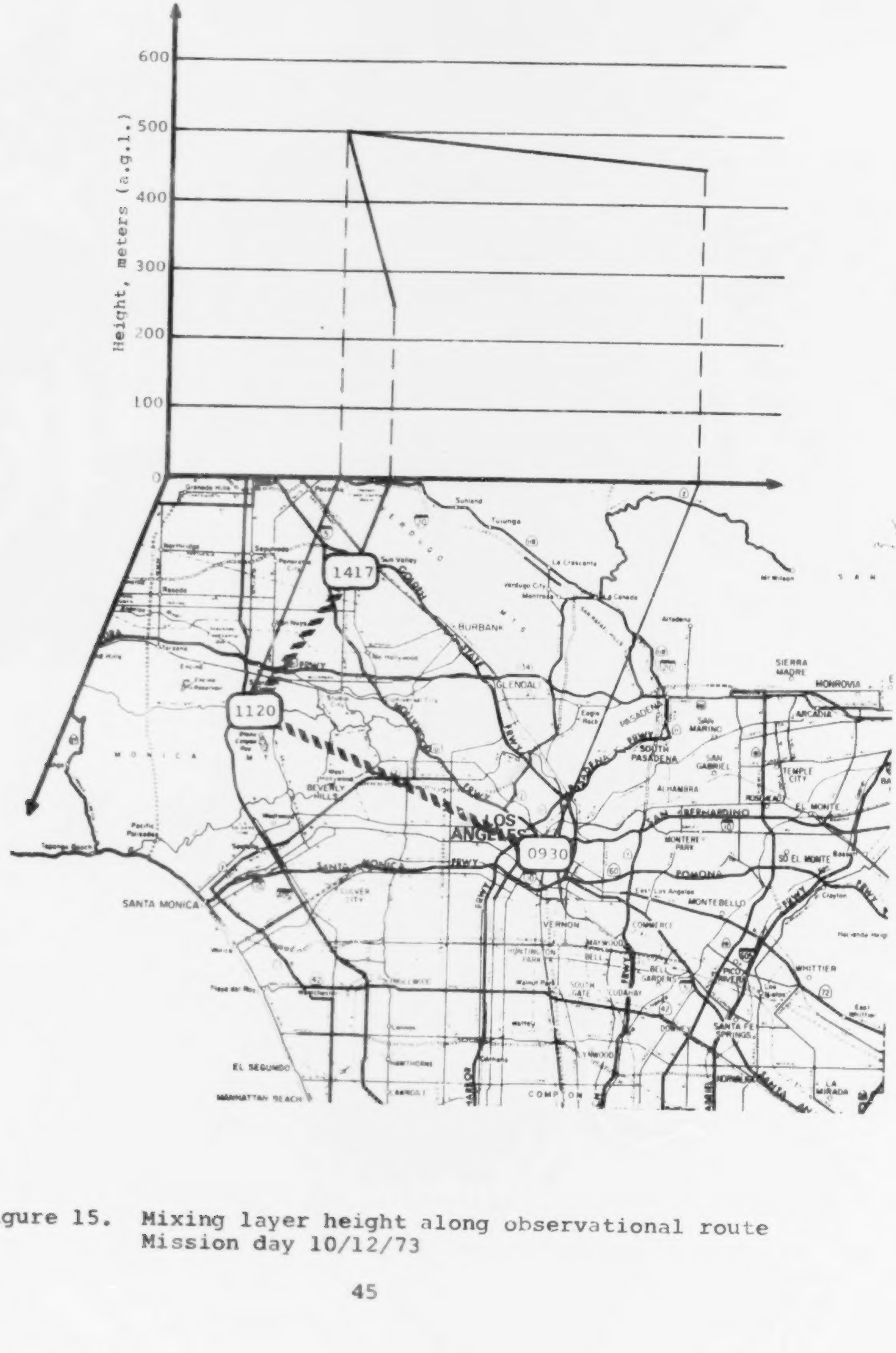


Figure 15. Mixing layer height along observational route
Mission day 10/12/73

MISSION DAY - 10/15/73

The snoptic conditions for the 15th were such that no significant meteorological changes occurred during the day in temperature, wind speed or direction, or humidity. These conditions were manifested in the Lidar returns by observing only minor altitude variations in the mixing depth over the time span from 0730 to 1440 PDT.

Early morning fog and haze were present which limited the Lidar ceiling at 0730 to about 213 meters above the surface. This was due to the high order of scattering and attenuation of the laser pulse by the suspended aerosols. Radiosonde data placed this early morning inversion base at 196 meters with tops near 568 meters. Lidar returns from 0820 until 1400 PDT revealed strong layering near the inversion base or 275 meters, and the region above being overlaid with cleaner air. This meteorological condition produced a significant decrease in backscatter above 365 meters altitude. Strong trapping seems to have promoted the formation of two distinct aerosol layers especially at 0738 PDT.

Radiosonde data for 1130 PDT also revealed a strong temperature gradient of 11 to 12 degrees C, between the inversion base and top. This probably explains the significant particulate trapping or layering, which was revealed from Lidar data, near the base of the inversion.

This was a typical marine layer day. Early morning fog and stratus in the lowest 200 meters gave way to haze and smoke by 1000 PDT. Onshore winds, 5-9 mi/hr prevailed during the late morning and afternoon hours.

The radiosonde observation at the launch site (Downey), 0637 PDT, put the inversion base at 230 meters above the ground. The Lidar (Downey 31-47) at 0737 PDT indicated that the top of the aerosol layer was at 200 meters. Taking into consideration the time and space differences of these two observations, this is fair agreement.

The Lidar showed a gradual increase in the depth of the ground-based aerosol layer from 0737 PDT to 1128 PDT at which time a helicopter temperature profile put the inversion base at 275 meters, the same level at which the Lidar detected the top of the aerosol layer. The radiosonde observation made at this time (1130 PDT) at Los Angeles International Airport (LAX) reported the inversion base at 177 meters. This showed the typical daytime increase of depth of the marine (aerosol) layer with distance inland. LAX is 28 miles west of the location occupied by the Lidar at 1128 PDT. In general the variations in the mixing height along a line parallel to the coast are not as severe as on a line normal to the coast, barring other orographic effects.

At 1143 PDT another helicopter temperature sounding was taken. Again the height of the base of the temperature inversion was 275 meters. But now the Lidar began to detect a scattering of the returns from the top of the aerosol layer ranging from 245 to 360 meters. By 1230 PDT, the time of the next helicopter sounding, two layers of aerosols had emerged as seen by Lidar, one at 185 meters, the other at 320 meters. A small temperature inversion was found at 165 meters and another at 225 meters. Temperature data was not available above that level. At 1250 PDT, however, another sounding was taken by helicopter and this one reached 325 meters. The small inversion, previously detected at 225 meters, was no longer present at that level and no longer was the top of an aerosol layer. Instead, the aerosol profile had simplified with a single layer topping out at 350 meters. It is unfortunate that the helicopter did not penetrate the top of the aerosol layer in this case.

The last Lidar measurements were made from 1346 to 1440 PDT at a site on the north side of the hills that extend east from Whittier to the Santa Ana River and about one mile west of the river. Helicopter temperature soundings were not taken at this place and time. The Lidar revealed that the top of the aerosol layer on this side of the hills was 100 meters lower than that observed an hour earlier just south of the hills. The marked change in terrain seems the most plausible source of the difference in depth of the aerosol layer. For best comparison with inversion data, consider the 1230 PDT El Monte radiosonde data. El Monte is also on the north side of these hills but is 11 miles west northwest of the Lidar site at 1346 PDT. The raob also was taken an hour earlier than the Lidar observations. Bearing in mind these spatial and temporal differences of the two observations, the inversion base at 200 meters compared reasonably well with the top of the aerosol layer at about 250 meters.

It is apparent from these data for the morning and afternoon of October 15, 1973 that the better the time and place match-up of the inversion base and aerosol layer top measurements, the better their correspondence.

Chart 11. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 5 10/15/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600	230	480	230	330	196	568	196	296	0.2	Equipment Failure				
0700									0.5					
0800									0.5					200-225
0900									0.8					225-275
1000									2.0					250-275
1100									3.0					275-300
1200					177	567	238	287	3.0	228	838	228	378	275-375
1300									3.0					250-375
1400									8.0					350-425
1500									8.0					200-300
1600														200-300

NOTE I_b Inversion base (meters)
I_t Inversion top (meters)
DP_b Lower altitude of gradient change in dewpoint (meters)
DP_t Upper altitude of gradient change in dewpoint (meters)
Vsb Visibility at the surface (miles)
MLH Mixing layer height (meters)

Chart 12. SUMMARY OF OPERATION

MISSION DAY 10/15/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	Y	REMARKS
0600					Left Lidar Base
0725			31	47	Arrived @ launch site "J" Downey.
0738	*		"	"	
0745	*		"	"	
0748	*		"	"	
0805	*		"	"	
0820	*		"	"	
0822	*		"	"	
0834	*		"	"	
0836	*		"	"	
0855	*		"	"	
0858	*		"	"	
0923	*		"	"	
0927	*		"	"	
0935	*		"	"	
0936		*	"	"	
0940			"	"	Launch
0957	*		30	58	North on Long Beach Fwy. 7 to Santa Ana Fwy. 5.
1006		*	"	"	
1045	*		43	43	South on Santa Ana Fwy. 5 to Valley View Ave. in La Mirada.
1102	*		"	"	
1105	*		"	"	
1124	*		"	"	Rosecrans & Bellflower
1148	*		"	"	
1204	*		"	"	
1205		*	"	"	
1228	*		57	42	South on Santa Ana Fwy. 5, East on Riverside Fwy. 91, North on Orange Fwy. 57 to Nutwood off-ramp in Fullerton.
1229	*		"	"	
1246	*		"	"	
1302	*		"	"	
1306	*		"	"	
1323		*	"	"	
1346	*		59	55	North on Orange Fwy. 57, West on Pomona Fwy. 60 to Water St. offramp in Industry.

Chart 12 (continued). SUMMARY OF OPERATION

MISSION DAY 10/15/73

	LIDAR		L.A. BASIN GRID POSITION COORDINATES		
TIME	ON	OFF	X	X	REMARKS
1349	*		59	55	
1350	*		"	"	
1407	*		"	"	
1408	*		"	"	
1424	*		"	"	
1425	*		"	"	
1440		*	"	"	
1645					Arrived @ Lidar Base

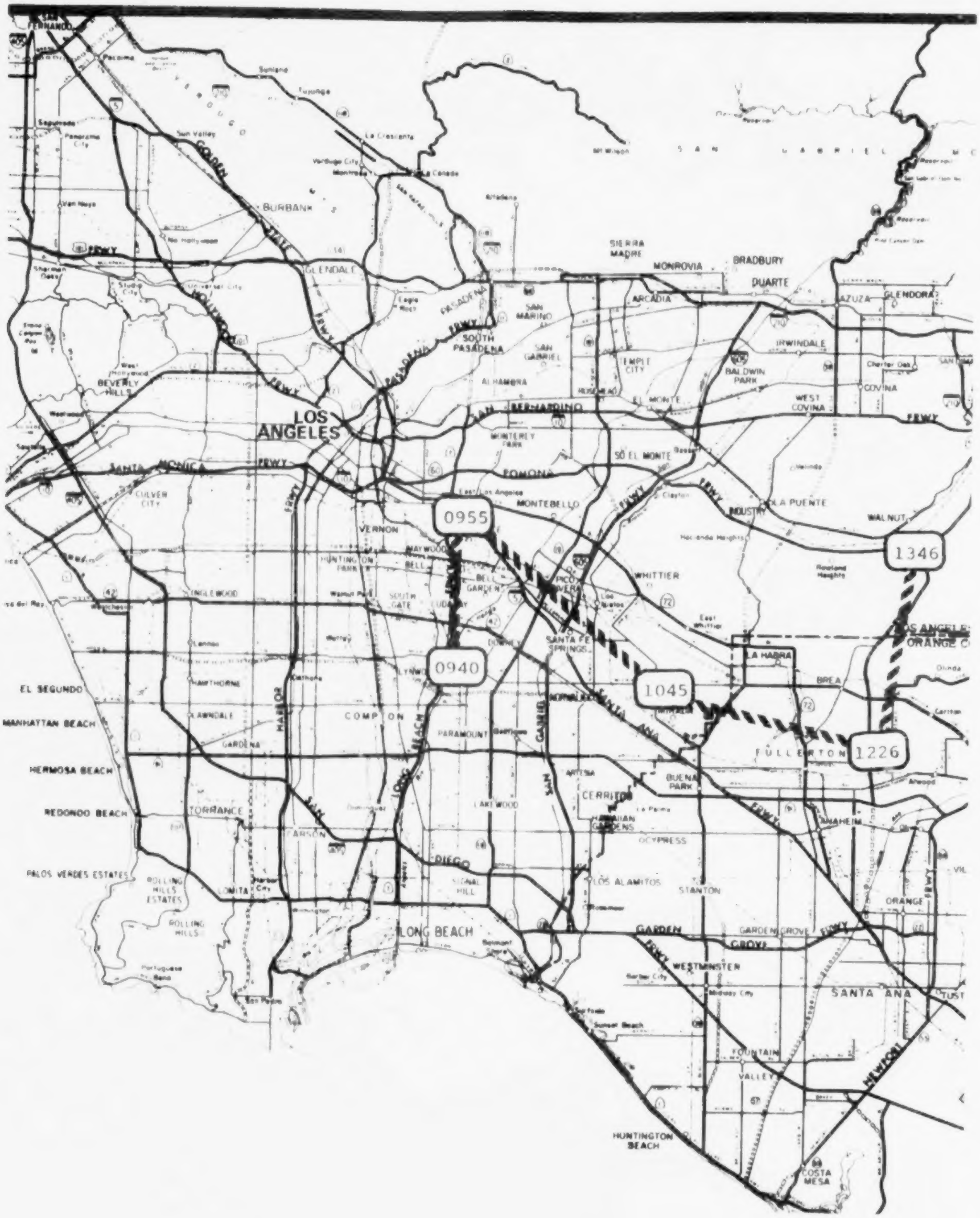

0940
0955
1045
1226
1346
SAN FERNANDO
BURBANK
GLENDALE
PASADENA
SOUTH PASADENA
SAN MARINO
SIERRA MADRE
MONROVIA
BRADBURY
DUARTE
ARCADIA
AZUSA
GLENDORA
IRWINDALE
BALDWIN PARK
COVINA
WEST COVINA
TEMPLE CITY
EL MONTE
SO EL MONTE
ALHAMBRA
SAN GABRIEL
MONTEREY PARK
MONTEBELLO
LOS ANGELES
BEVERLY HILLS
CULVER CITY
SANTA MONICA FWY
SAN BERNARDINO FWY
POMONA
VERNON
MAYWOOD
HUNTINGTON PARK
BELL
BELL GARDENS
SOUTH GATE
PICO RIVERA
WHITTIER
INDUSTRY
LA PUENTE
WALNUT
SANTA FE SPRINGS
LA HABRA
BREA
FULLERTON
BUENA PARK
ANAHEIM
ORANGE
SANTA ANA
LOS ANGELES
ORANGE CO
INGLEWOOD
EL SEGUNDO
HAWTHORNE
LAWNDALE
GARDENA
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
TORRANCE
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
ROLLING HILLS
LOMITA
CARSON
COMPTON
PARAMOUNT
LYNWOOD
DOWNEY
LAKEWOOD
CERRITOS
ARTESIA
HAWAIIAN GARDENS
CYPRESS
LOS ALAMITOS
STANTON
SIGNAL HILL
LONG BEACH
GARDEN GROVE
WESTMINSTER
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA
HARBOR
SAN DIEGO
LONG BEACH
GARDEN GROVE FWY
NEWPORT
SAN GABRIEL
SANTA ANA FWY
SAN GABRIEL

Figure 16. Mobile Lidar route map
Mission day 10/15/73

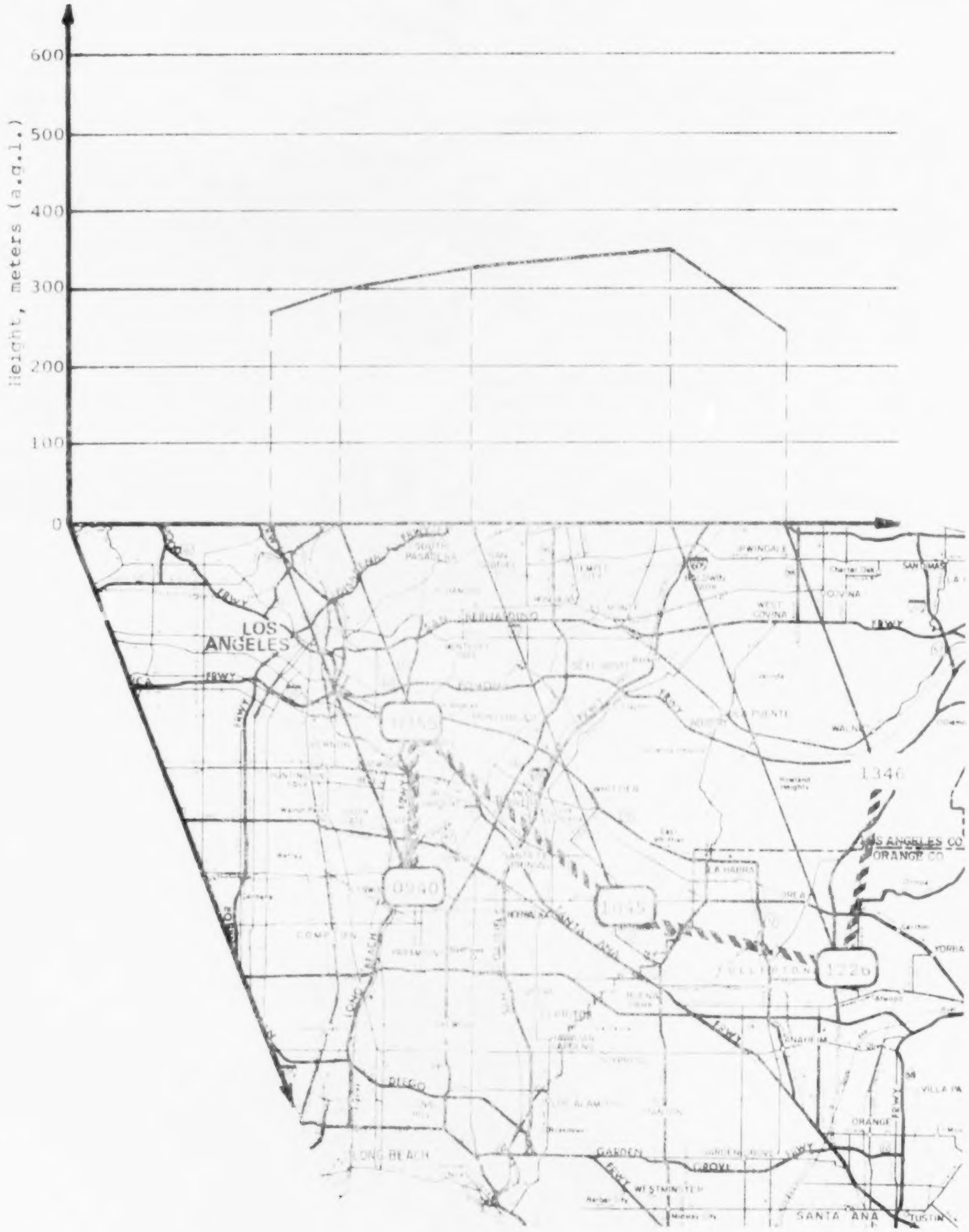


Figure 17. Mixing layer height along observational route
Mission day 10/15/73

MISSION DAY - 10/16/73

Early morning conditions began with fog and low ceiling causing limited visibility to exist throughout most of the Los Angeles basin. A surface based inversion existed within the central Los Angeles region and sloped upward toward the coastline reaching a height of 177 meters at 0540. The temperature profile obtained at the launch site also revealed a surface inversion base. Some stratus and light haze and fog persisted throughout the day. Radiosonde data for El Monte at 1345 PDT showed a strong gradient at the inversion base at 307 meters with a corresponding reduction in moisture content above that height.

Lidar operation began at approximately 12 noon near launch site "A" in central Los Angeles. The remnants of the early morning fog were evident in all the returns, with indications that opacity of the haze was not sufficient to fully attenuate all of the scattered energy. The characteristic boundary separating the upper level dry air from the moist air beneath the inversion was indicated in the raw data. The boundary height corresponds closely with the inversion base reported by the 1340 PDT El Monte radiosonde.

The route followed by the Lidar van from noon until 1530 PDT closely parallels the San Gabriel Mountains. Some degree of influence by terrain features was evidenced by a gradual height increase of the inversion boundary as the observation point proceeded toward the mountains.

Chart 13. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 6 10/16/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600	Sfc	600	Sfc	150	177	616	92	200	00	Sfc	649	167	289	
0700									0.2					
0800									0.8					
0900									1.0					
1000									1.0					
1100									1.2					
1200					177	677	177	238	1.5					275-375
1300									2.5					300-375
1400									3.0	307	557	307	359	275-375
1500									3.0					
1600														

NOTE	I_b	Inversion base (meters)
	I_t	Inversion top (meters)
	DP_b	Lower altitude of gradient change in dewpoint (meters)
	DP_t	Upper altitude of gradient change in dewpoint (meters)
	Vsb	Visibility at the surface (miles)
	MLH	Mixing layer height (meters)

Chart 14. SUMMARY OF OPERATION

MISSION DAY 10/16/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	Y	
1040					Left Lidar Base
1213			24	59	Launch site "A" Downtown L.A.
1220	*		"	"	
1222	*		"	"	
1228	*		"	"	
1229	*		"	"	
1235	*		"	"	
1236	*		"	"	
1240	*		"	"	
1245	*		"	"	
1248		*	"	"	
1251	*		"	"	
1252	*		"	"	
1254	*		"	"	
1258	*		"	"	
1259	*		"	"	
1302	*		"	"	
1303	*		"	"	
1304	*		"	"	
1305		*	"	"	
1340	*		28	68	North on Golden State Fwy. 5, North on Pasadena Fwy. 11 to Ave. 57 offramp in Highland Park.
1341	*		"	"	
1342	*		"	"	
1343	*		"	"	
1348	*		"	"	
1351	*		"	"	
1352	*		"	"	
1354	*		"	"	
1356		*	"	"	
1412	*		32	70	North on Pasadena Fwy. 11 to end of Freeway in Pasadena.
1417	*		"	"	
1419	*		"	"	
1427	*		"	"	
1428	*		"	"	
1431	*		"	"	
1438	*		"	"	
1439	*		"	"	
1440	*		"	"	
1443	*		"	"	
1444		*	"	"	

Chart 14 (continued). SUMMARY OF OPERATION

MISSION DAY 10/16/73

TIME	LIDAR ON	 OFF	L.A. BASIN GRID POSITION COORDINATES X	 X	REMARKS
1530	*		50	70	North on Arroyo Parkway, East on Colorado Blvd. 60, to Foothill Fwy. 210 to Buena Vista offramp in Duarte.
1531	*		"	"	
1532	*		"	"	
1534		*	"	"	
2330					Arrived @ Lidar Base

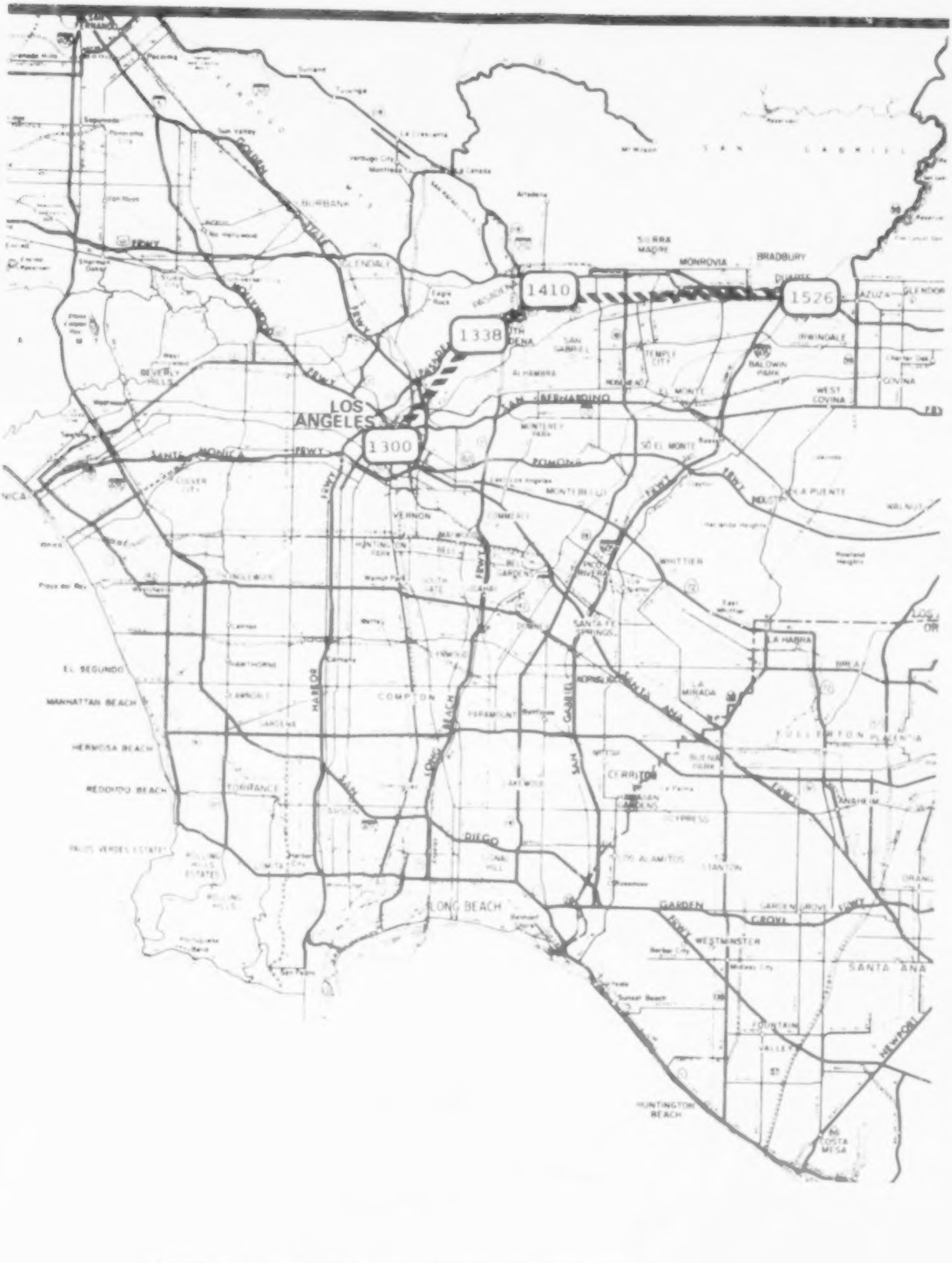

1300
1338
1410
1526
LOS ANGELES
BURBANK
GLENDALE
SIERRA MADRE
MONROVIA
BRADBURY
DUARTE
AZUSA
GLENDORA
IRWINDALE
BALDWIN PARK
COVINA
WEST COVINA
TEMPLE CITY
EL MONTE
SAN GABRIEL
ALHAMBRA
MONTEREY PARK
SANTA MONICA
FRWY
SAN BERNARDINO
POMONA
VERNON
MONTEBELLO
WHITTIER
LA PUENTE
HUNTINGTON PARK
SANTA FE SPRINGS
LA HABRA
BREA
LA MIRADA
FULLERTON
BUENA PARK
CERRITOS
ANAHEIM
COMPTON
PARAMOUNT
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
TORRANCE
SAN DIEGO
LONG BEACH
HARBOR
SAN GABRIEL
SANTA ANA
GARDEN GROVE
WESTMINSTER
STANTON
CYPRESS
LOS ALAMITOS
LAKEWOOD
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA
NEWPORT
SAN GABRIEL

Figure 18. Mobile Lidar route map
Mission day 10/16/73

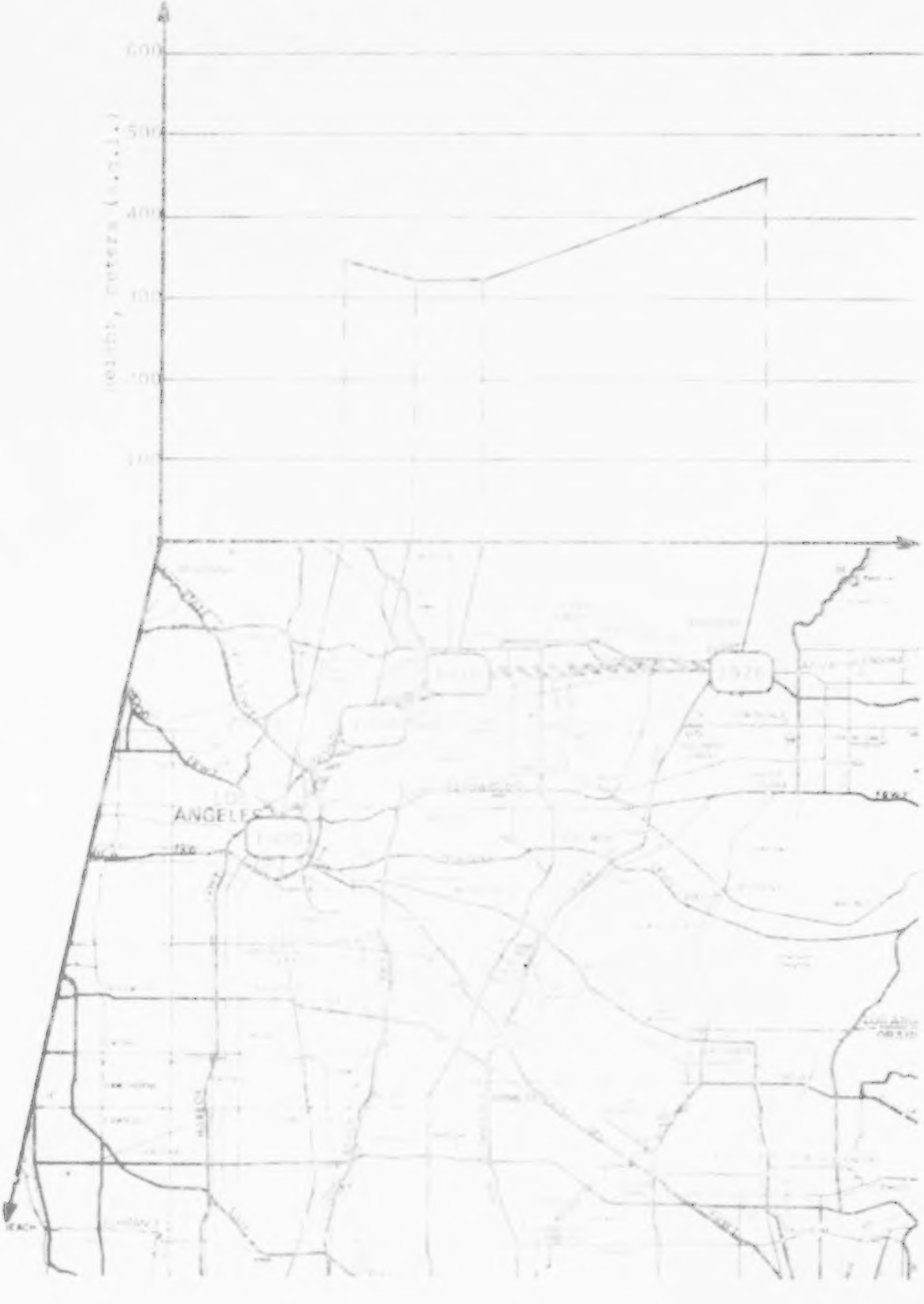


Figure 19. Mixing layer height along observational route
Mission day 10/16/73

MISSION DAY - 10/17/73

Early morning fog and stratus were blanketing all coastal areas and as far inland as Burbank and central Los Angeles. The 0500 PDT radiosonde records for both LAX and El Monte show humidity values decreasing appreciably above 200 meters indicating the wide spatial extent of the upper level moisture layer. A low level, 77 meters, inversion base existed near the coast but was surface based in El Monte and the launch site in central Los Angeles. The typical temperature inversion top was also present above the moisture layer at about 446 meters, rising to a height of 688 meters near the mountains.

The characteristic signal returns from a combination moisture and pollution layer were evident in the Lidar data from 0930 to 1350 PDT. The base of this layer remained consistently within the 300 to 500 meter altitude region from 0930 to approximately 1300 PDT. This base is indicated on the chart. Following that time, the boundary appeared to dissipate or became intermixed with the low level haze already present. Penetration through this layer to drier air above was revealed by the scattering discontinuity. The moisture profile from the El Monte radiosonde record was seen to correspond with the heights given here. Also at 1350 PDT, the energy from the laser began dropping and resulted in what appeared to be a decrease in the moisture gradient boundary. This situation was not remedied in time before two hours of data recording had elapsed.

Chart 15. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 7 10/17/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600					77	446	168	308	0.1	Sfc	688	228	400	
0700									2.0					
0800	Sfc	420	100	420					3.0					
0900									3.0					350-500
1000									5.0					350-500
1100	100	300	100	300					5.0					400-475
1200					147	336	147	238	6.0	none		none		300-400
1300									8.0					300-400
1400									8.0					300-400
1500									8.0					100-300
1600														

NOTE		
	I_b	Inversion base (meters)
	I_t	Inversion top (meters)
	DP_b	Lower altitude of gradient change in dewpoint (meters)
	DP_t	Upper altitude of gradient change in dewpoint (meters)
	Vsb	Visibility at the surface (miles)
	MLH	Mixing layer height (meters)

Chart 16. SUMMARY OF OPERATION

MISSION DAY 10/17/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	Y	
0715					Left Lidar Base
0930			24	59	Launch site "A" Downtown L.A.
0936	*		"	"	
0937	*		"	"	
0939	*		"	"	
0944	*		"	"	
0946	*		"	"	
0948	*		"	"	
0951	*		"	"	
0952	*		"	"	
0956	*		"	"	
0957	*		"	"	
1000	*		"	"	
1001		*	"	"	
1021	*		31	57	North on Long Beach Fwy. 7, North on Atlantic to Santa Ana Fwy. 5.
1023	*		"	"	
1024	*		"	"	
1028	*		"	"	
1031	*		"	"	
1032	*		"	"	
1032		*	"	"	
1113	*		26	34	South on Atlantic to Santa Ana Fwy., South on Santa Ana Fwy. to Willow in Long Beach.
1114	*		"	"	
1115	*		"	"	
1122	*		"	"	
1128	*		"	"	
1130	*		"	"	
1131	*		"	"	
1134	*		"	"	
1135		*	"	"	
1149			30	34	East on Willow to Walnut in Signal Hill.
1153	*		"	"	
1154	*		"	"	
1158	*		"	"	
1159	*		"	"	
1200	*		"	"	

Chart 16 (continued). SUMMARY OF OPERATION

MISSION DAY 10/17/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	X	REMARKS
1203	*		30	34	
1206	*		"	"	
1208	*		"	"	
1211	*		"	"	
1212	*		"	"	
1215	*		"	"	
1215		*	"	"	
1304	*		36	32	East on Willow to Studebaker Rd. South to Atherton in Long Beach just West of 405 & 605 Freeways.
1306	*		"	"	
1307	*		"	"	
1310	*		"	"	
1311		*	"	"	
1340	*		45	38	North on San Gabriel River Fwy. 605, East on Artesia Fwy. 91 to Knott offramp in Buena Park.
1342	*		"	"	
1345	*		"	"	
1346		*	"	"	
1351	*		"	"	
1354	*		"	"	
1355	*		"	"	
1356		*	"	"	
1414	*		56	39	East on Artesia Fwy. 91 to State College 250 in Anaheim.
1416		*	"	"	
1444	*		74	40	East on Riverside Fwy. 91 to Gypsum 2 miles West of Orange - Riverside County Line.
1446	*		"	"	
1447	*		"	"	
1449	*		"	"	
1452	*		"	"	
1453	*		"	"	
1456	*		"	"	
1457	*		"	"	
1458	*		"	"	
1504	*		"	"	
1509	*		"	"	
1519	*		"	"	
1525		*	"	"	

Chart 16 (continued). SUMMARY OF OPERATION

MISSION DAY 10/17/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	L.A. BASIN GRID POSITION COORDINATES X	REMARKS
1551	*		74	40	On Move - Riverside Fwy.
1607	*		"	"	Orange County line
1610	*		"	"	Green River Rd.
1613	*		"	"	Serfas Club Drive.
1615	*		"	"	Lincoln Ave.
1617		*	"	"	
2000					Arrived @ Lidar Base

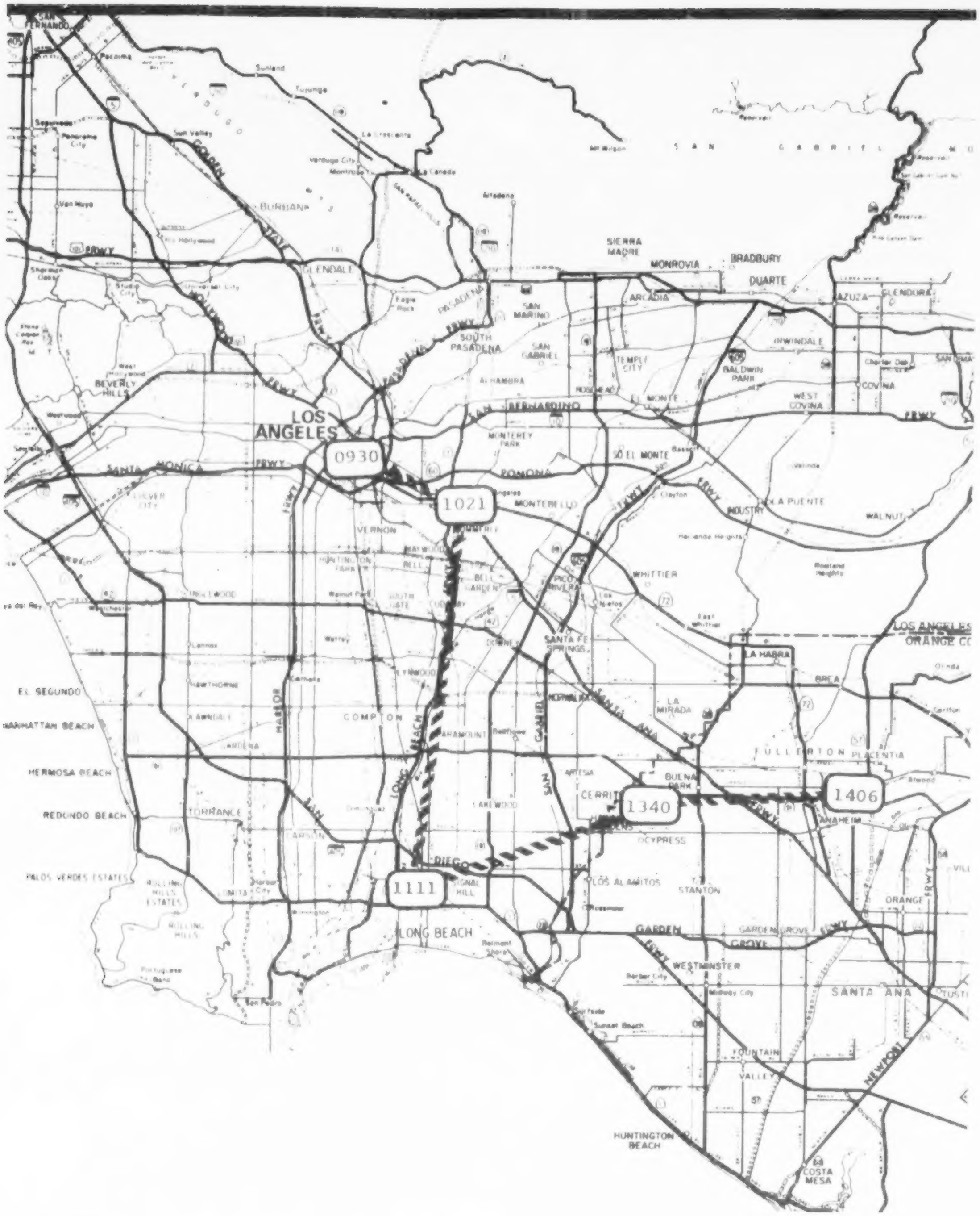
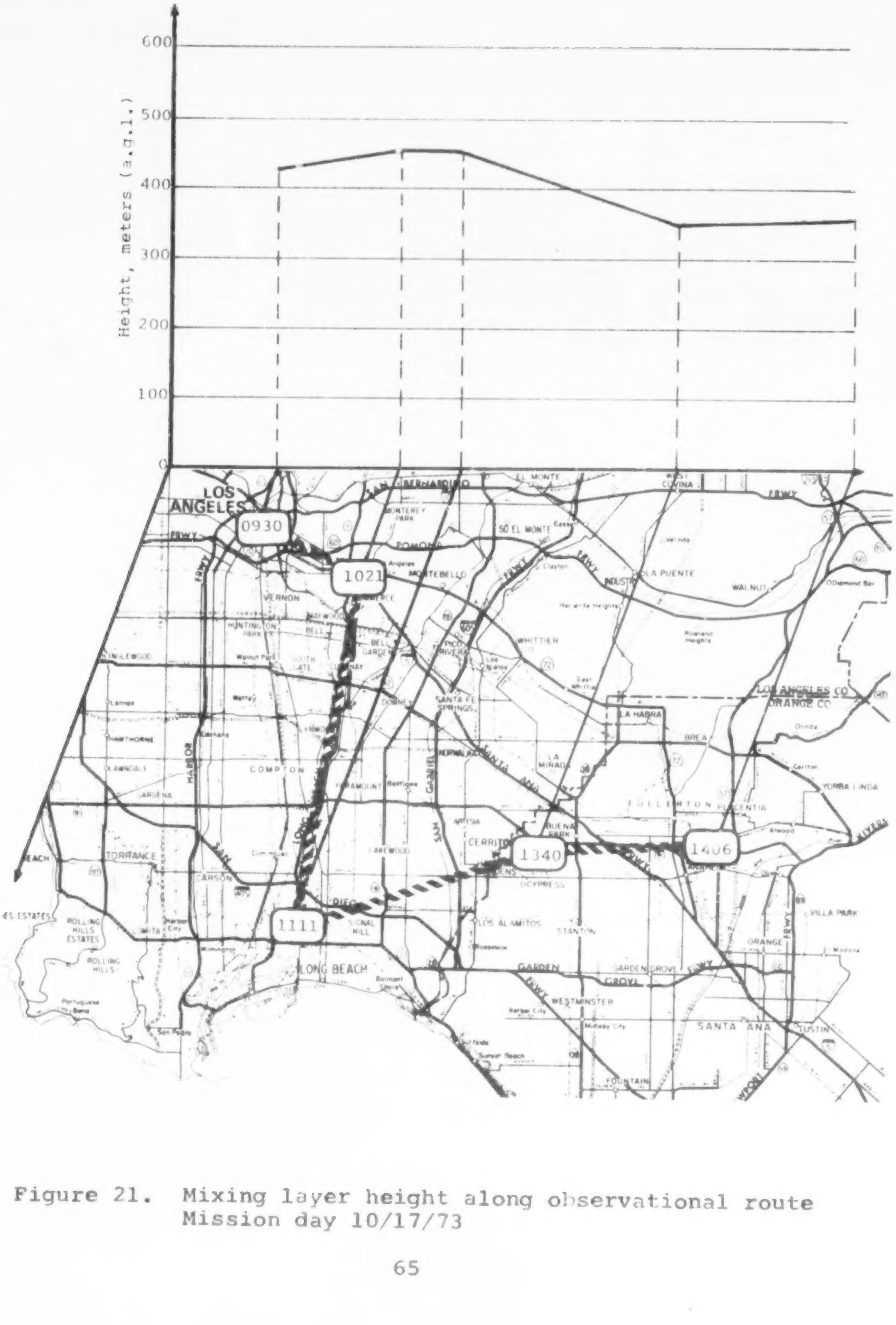

0930
1021
1111
1340
1406
LOS ANGELES
SAN GABRIEL
BURBANK
GLENDALE
PASADENA
SOUTH PASADENA
SAN MARINO
ALHAMBRA
MONTEREY PARK
SIERRA MADRE
MONROVIA
BRADBURY
DUARTE
ARCADIA
AZUSA
GLENDORA
IRWINDALE
BALDWIN PARK
COVINA
WEST COVINA
TEMPLE CITY
EL MONTE
SO EL MONTE
LA PUENTE
WALNUT
MONTEBELLO
VERNON
HUNTINGTON PARK
BELL
SOUTH GATE
WHITTIER
PICO RIVERA
SANTA FE SPRINGS
LA HABRA
BREA
LA MIRADA
FULLERTON
PLACENTIA
BUENA PARK
ANAHEIM
CYPRESS
STANTON
ORANGE
SANTA ANA
GARDEN GROVE
WESTMINSTER
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA
LOS ALAMITOS
LONG BEACH
SIGNAL HILL
LAKEWOOD
CERRITOS
ARTESIA
COMPTON
PARAMOUNT
DOWNEY
NORWALK
LYNWOOD
CARSON
TORRANCE
GARDENA
HAWTHORNE
INGLEWOOD
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
ROLLING HILLS
CULVER CITY
BEVERLY HILLS
SAN FERNANDO
LOS ANGELES
ORANGE CO
SANTA MONICA FRWY
SAN BERNARDINO FRWY
POMONA FRWY
SANTA ANA FRWY
LONG BEACH FRWY
HARBOR
SAN DIEGO
GARDEN GROVE FRWY
NEWPORT FRWY
PASADENA FRWY
GOLDEN STATE
VENTURA FRWY

Figure 20. Mobile Lidar route map
Mission day 10/17/73



Height, meters (a.g.l.)
600
500
400
300
200
100
0
0930
1021
1111
1340
1406
LOS ANGELES
LONG BEACH
COMPTON
TORRANCE
WHITTIER
FULLERTON
SANTA ANA

Figure 21. Mixing layer height along observational route Mission day 10/17/73

MISSION DAY - 10/18/73

Weather conditions for Los Angeles and vicinity were uniform throughout the basin for ground temperature, humidity and winds. Some early morning haze was indicated near the coast, and skies contained some upper level clouds during the morning and late afternoon.

Radiosonde data for both LAX and El Monte showed a surface based inversion at 0530 PDT. Higher ground temperatures at midday contributed to an altitude increase in the inversion base by 68 meters along the coast, but created a near-adiabatic condition in the interior regions. Very light surface winds, less than 5 knots, prevented any maintenance of the inversion condition by the cooler marine layer. The LAX radiosonde data at 1130 PDT recorded the inversion top at approximately 570 meters, only slightly higher than the previous sounding.

The Lidar backscatter profiles all appeared to undergo measurable attenuation, as encountered in a fog or water/haze atmosphere. Detected near ground level at the launch site was the existence of echoes indicative of stratification similar to trapping at the inversion base. It is likely that the inversion base was above ground for that morning, but was not within the temperature resolution limits for the radiosonde. The echoes returned from this region began fluctuating in altitude after 1000 PDT, becoming weaker and disappearing altogether after 12 noon.

The significance of the upper level data does not appear directly related to the temperature structure but rather to a discontinuity between air masses. Some fallof in moisture concentration at this level was found in the radiosonde profiles. However, the existence of significant attenuation that appeared in the backscatter returns is cause to suspect a combination of moisture and absorbing mechanisms that could have been distributed beneath the inversion top.

On the return to the launch site at about 1135 PDT, an elevated layer between 205 and 377 meters (a.g.l.) was again detected. Moving eastward to La Mirada, discontinuties still appeared from this altitude although no definitive indication of moisture or temperature inversion could be found.

Chart 17. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 8 10/18/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600					Sfc	348	68	110	4	Sfc	469	54	109	
0700	Incomplete								4					
0800									10					350-600
0900									8					475-550
1000									8					475-550
1100									8					425-500
1200					68	568	none		7	none		none		250-475
1300									10					300-375
1400									10					300-375
1500									20					
1600														

NOTE

I_b	Inversion base (meters)
I_t	Inversion top (meters)
DP_b	Lower altitude of gradient change in dewpoint (meters)
DP_t	Upper altitude of gradient change in dewpoint (meters)
Vsb	Visibility at the surface (miles)
MLH	Mixing layer height (meters)

Chart 18. SUMMARY OF OPERATION

MISSION DAY 10/18/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	Y	REMARKS
0700					Left Lidar Base.
0802			31	47	Launch Site "J" Downey.
0826	*		"	"	
0828	*		"	"	
0833	*		"	"	
0836	*		"	"	
0837	*		"	"	
0845	*		"	"	
0846	*		"	"	
0853	*		"	"	
0854	*		"	"	
0855	*		"	"	
0857		*	"	"	
0915			"	"	Launch
0937	*		28	36	South on Long Beach Fwy. 7, South on Long Beach Blvd. to Carson in North Long Beach.
0938	*		"	"	
0941	*		"	"	
0942		*	"	"	
0945	*		"	"	
0946	*		"	"	
0949		*	"	"	
1006	*		29	38	East on Carson, North on Orange to San Antonio Drive.
1007	*		"	"	
1009		*	"	"	
1035	*		30	29	South on Orange to Ocean, East to Cherry.
1036	*		"	"	
1037	*		"	"	
1040	*		"	"	
1041	*		"	"	
1047	*		"	"	
1050	*		"	"	
1051	*		"	"	
1052		*	"	"	
1055	*		"	"	
1056	*		"	"	
1059		*	"	"	

Chart 18 (continued). SUMMARY OF OPERATION

MISSION DAY 10/18/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	X	
1136	*		31	47	Return to Launch Site.
1137	*		"	"	
1138	*		"	"	
1139	*		"	"	
1143	*		"	"	
1144	*		"	"	
1147	*		"	"	
1148	*		"	"	
1151	*		"	"	
1152	*		"	"	
1153	*		"	"	
1154		*	"	"	
1225	*		44	46	Imperial Hwy. in La Mirada
1226	*		"	"	
1231	*		"	"	
1232	*		"	"	
1233	*		"	"	
1240	*		"	"	
1241	*		"	"	
1247	*		"	"	
1249	*		"	"	
1250	*		"	"	
1251		*	"	"	
1322	*		45	51	Whittier Blvd. 72 & Colima Rd. N 8.
1324	*		"	"	
1325	*	*	"	"	
1353	*		52	55	La Puente.
1355	*		"	"	
1356	*		"	"	
1357		*	"	"	
1425	*		53	63	In West Covina, San Bernardino Fwy. & Hwy. 39.
1426	*		"	"	
1428	*		"	"	
1429		*	"	"	
1437	*		"	"	
1438	*		"	"	
1439	*		"	"	
1440		*	"	"	

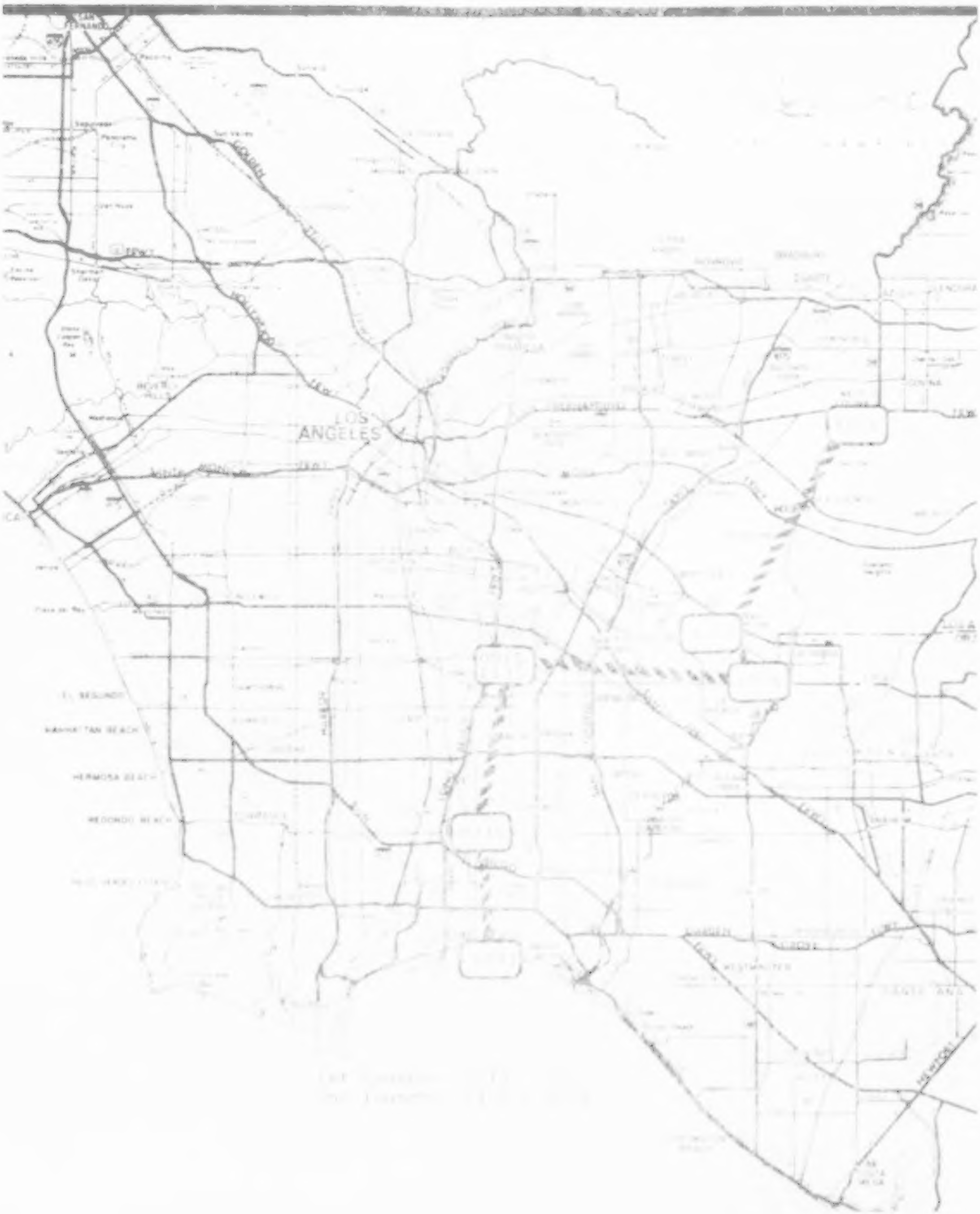
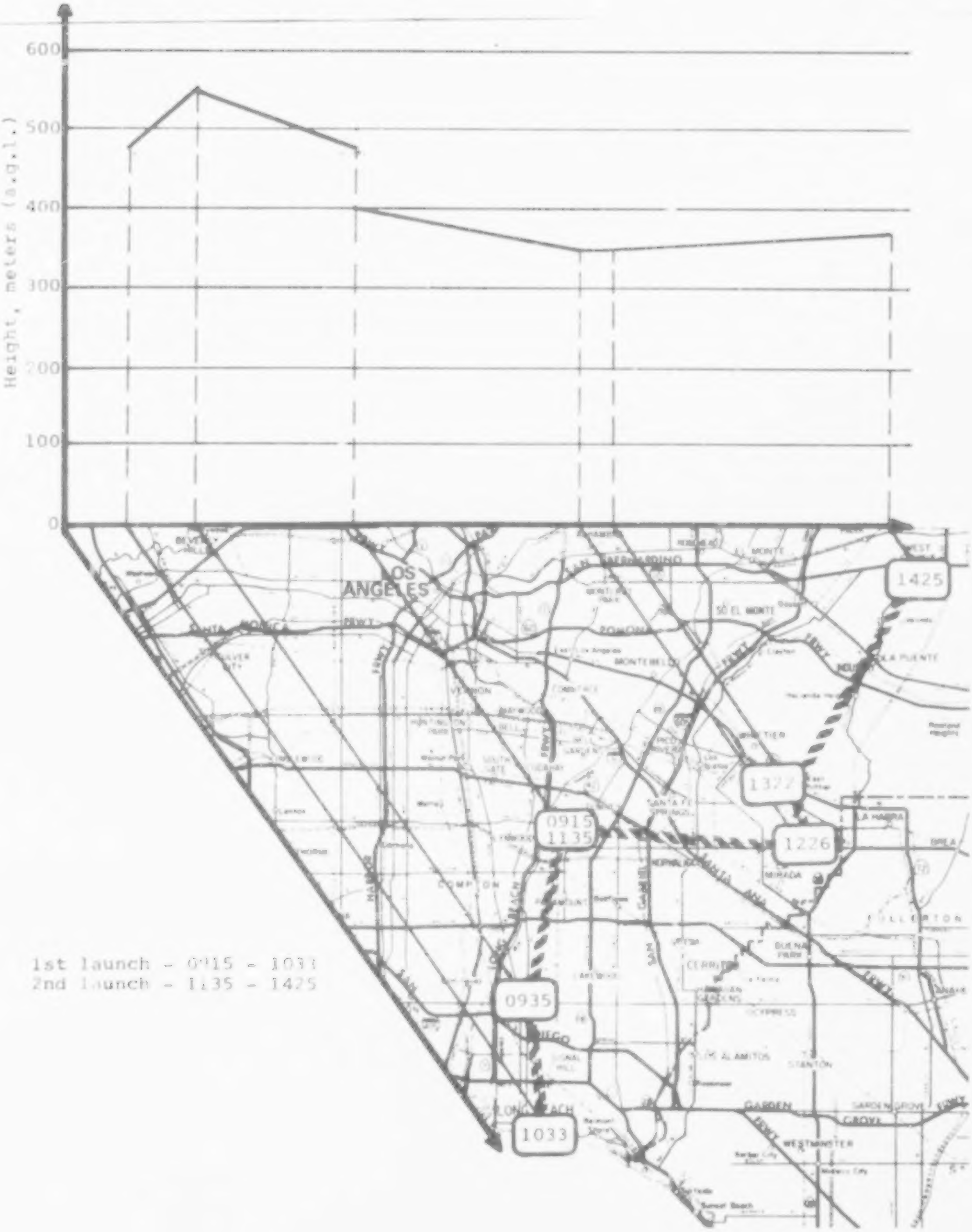

LOS ANGELES
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH

Figure 22. Mobile Lidar route map
Mission day 10/18/73



1st launch - 0915 - 1033
2nd launch - 1135 - 1425

Figure 23. Mixing layer height along observational route
Mission day 10/18/73

MISSION DAY - 10/24/73

The early morning meteorological conditions at the launch site revealed a surface based inversion topped by a second inversion base at approximately 520 meters. This temperature structure was significantly different compared to the LAX 0532 PDT radiosonde data or the El Monte 0656 PDT data. A significant amount of moisture was detected in all cases to altitudes in excess of 800 meters. Wind directions changed along the coast and inland between morning and afternoon hours, adding ground level moisture and maintaining some haze and obscured visibility. A well developed inversion also appeared in the afternoon (1130 PDT) LAX sounding, with a base at 138 meters and top at 558 meters (a.g.l.).

The early morning (0828 PDT) Lidar data revealed remnants of the multiple inversion base. Scattering appeared randomly distributed between the 503 meter level and 777 meter level. Throughout the next three hours, the indicated significant levels drop in altitude in agreement to what was observed in the radiosonde profiles.

The Lidar returns from 1114 to almost 12 noon, were consistently layered between 475 and 560 meters (a.g.l.) indicating a strong trapping condition for any particulates. This level, when corrected for regional differences in altitude, corresponded to the reported temperature inversion base.

Chart 19. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 10 10/24/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600					796	1129	796	949	15	Sfc	408/1167	832	1167	
0700	Sfc	170							12					
0800	Incomplete								12					400-800
0900									12					500-600
1000									12					400-600
1100									8					450-575
1200					138	558	none		10					350-550
1300									12					350-475
1400									12	554	749	554	609	
1500									30					
1600														

NOTE I_b Inversion base (meters)

I_t Inversion top (meters)

DP_b Lower altitude of gradient change in dewpoint (meters)

DP_t Upper altitude of gradient change in dewpoint (meters)

Vsb Visibility at the surface (miles)

MLH Mixing layer height (meters)

Chart 20. SUMMARY OF OPERATION

MISSION DAY 10/24/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	Y	
0700					Left Lidar Base
0800			31	47	Launch Site "J" Downey.
0829	*		"	"	
0836	*		"	"	
0837	*		"	"	
0840	*		"	"	
0842	*		"	"	
0847	*		"	"	
0852	*		"	"	
0856	*		"	"	
0857		*	"	"	
0900			"	"	Launch
0929	*		26	34	Long Beach
0931	*		"	"	
0932		*	"	"	
0940	*		"	"	
0943	*		"	"	
0946		*	"	"	
0956	*		29	"	Signal Hill
0958	*		"	"	
1000	*		"	"	
1003	*		"	"	
1004	*		"	"	
1006	*		"	"	
1007	*		"	"	
1010	*		"	"	
1011		*	"	"	
1032	*		37	38	Hawaiian Gardens, 605 Fwy. & Carson.
1034	*		"	"	
1036	*		"	"	
1038	*		"	"	
1039		*	"	"	
1042	*		"	"	
1046	*		"	"	
1047	*		"	"	
1050	*		"	"	
1051	*		"	"	
1052		*	"	"	

Chart 20 (continued). SUMMARY OF OPERATION

MISSION DAY 10/24/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	X	
1114	*		45	40	Buena Park, Artesia Fwy. & Knott
1117	*		"	"	
1119	*		"	"	
1123	*		"	"	
1125	*		"	"	
1128	*		"	"	
1129	*		"	"	
1132		*	"	"	
1207	*		47	44	La Mirada
1210	*		"	"	
1211	*		"	"	
1214	*		"	"	
1216	*		"	"	
1220	*		"	"	
1222	*		"	"	
1226	*		"	"	
1232	*		"	"	
1233	*		"	"	
1234		*	"	"	
1255	*		45	50	East Whittier, Whittier Blvd. 72 & Colima N 8.
1257	*		"	"	
1300	*		"	"	
1305	*		"	"	
1308	*		"	"	
1310	*		"	"	
1312	*		"	"	
1315	*		"	"	
1317	*		"	"	
1318		*	"	"	

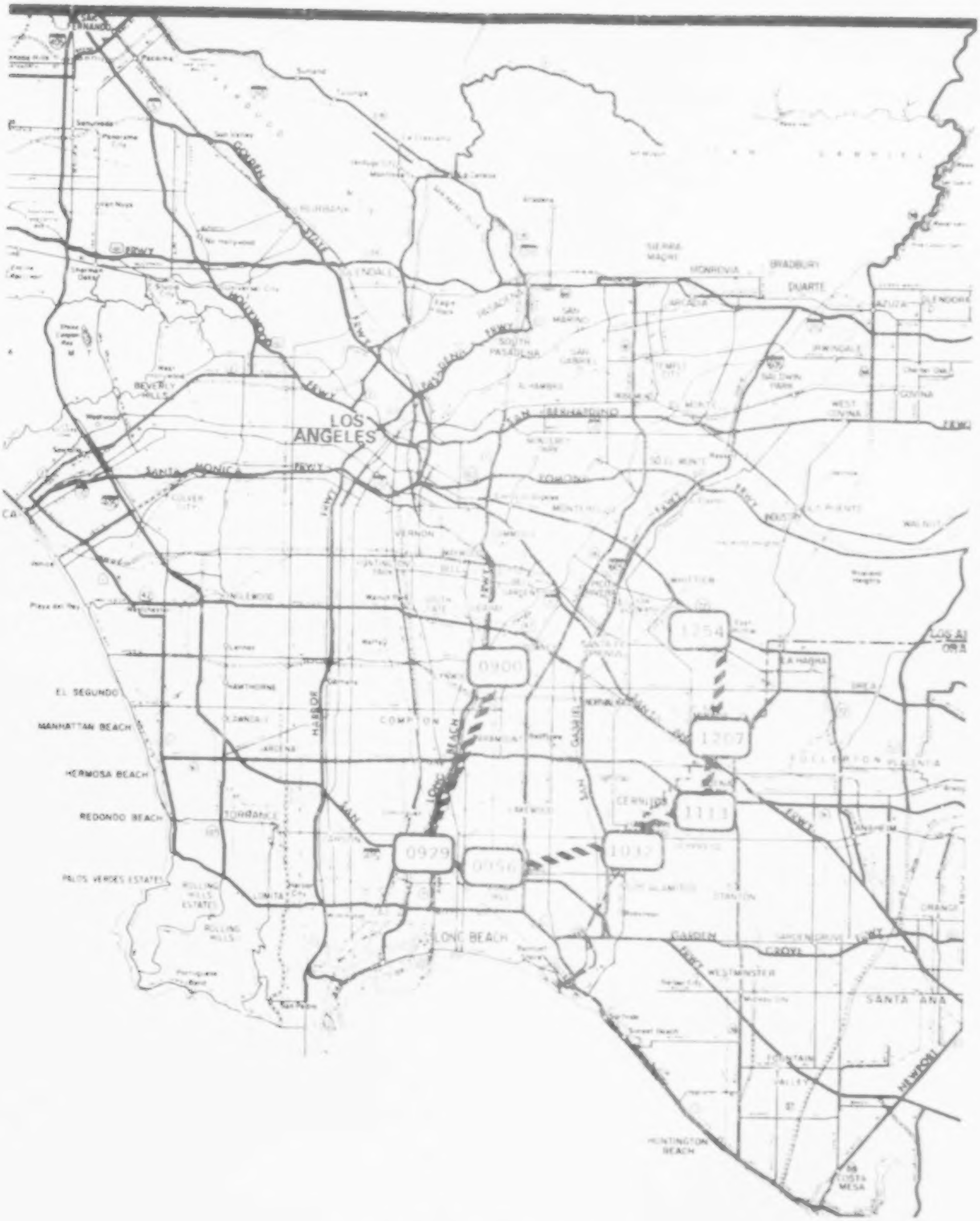

0900
0929
0956
1032
1113
1207
1254
LOS ANGELES
BEVERLY HILLS
SANTA MONICA
BURBANK
GLENDALE
SOUTH PASADENA
SAN MARINO
SIERRA MADRE
MONROVIA
BRADBURY
DUARTE
ARCADIA
AZUSA
GLENDORA
BALDWIN PARK
WEST COVINA
COVINA
EL MONTE
SAN GABRIEL
ALHAMBRA
MONTEBELLO
VERNON
WHITTIER
LA HABRA
SANTA FE SPRINGS
NORWALK
CERRITOS
COMPTON
HAWTHORNE
INGLEWOOD
GARDENA
TORRANCE
LONG BEACH
LAKEWOOD
STANTON
GARDEN GROVE
WESTMINSTER
SANTA ANA
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA
ORANGE
ANAHEIM
FULLERTON
PLACENTIA
BREA
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
ROLLING HILLS
HARBOR
SAN GABRIEL
LONG BEACH
SAN BERNARDINO
POMONA
GOLDEN STATE
HOLLYWOOD
PASADENA
NEWPORT
FRWY

Figure 24. Mobile Lidar route map
Mission day 10/24/73

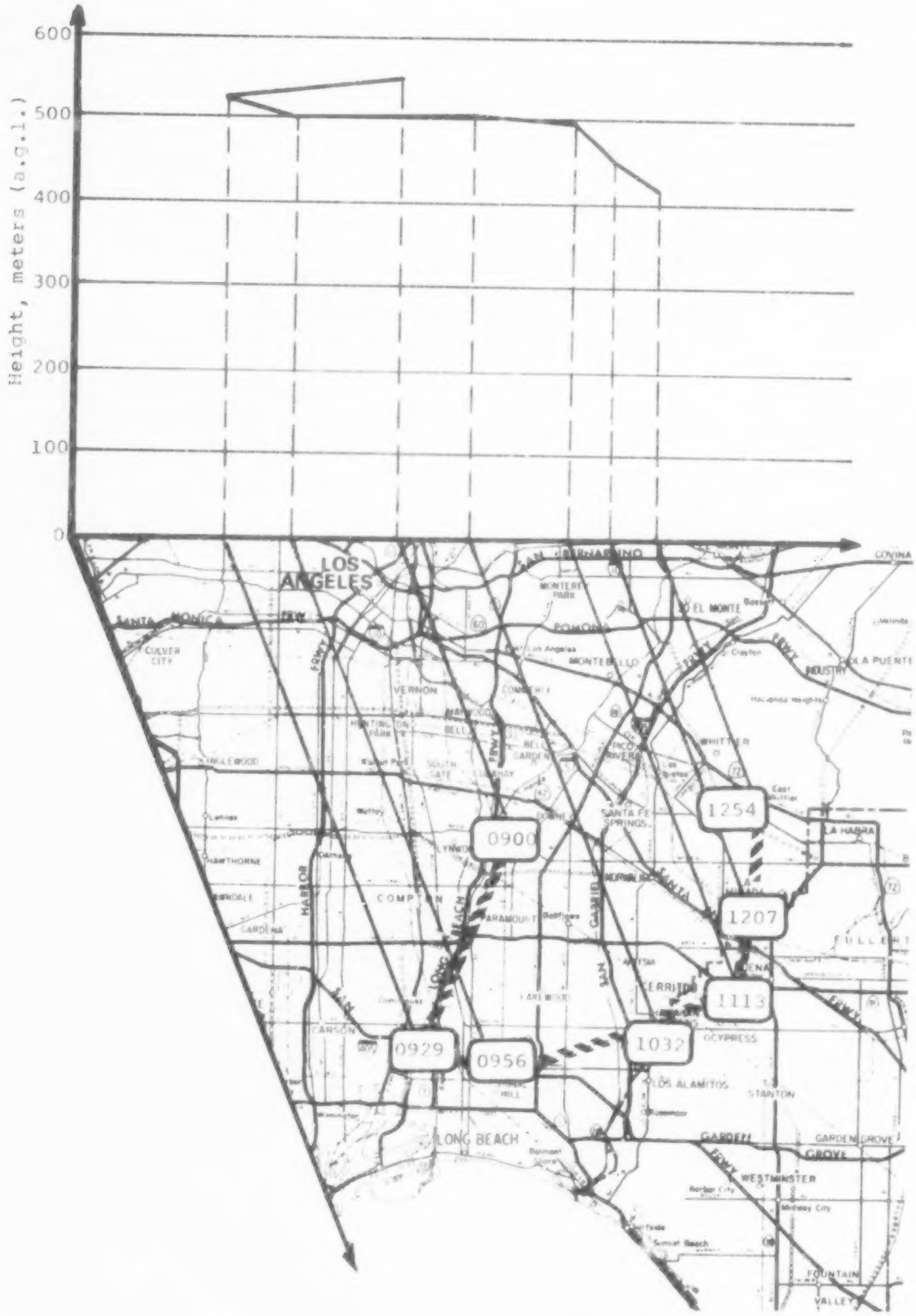


Figure 25. Mixing layer height along observational route
Mission day 10/24/73

MISSION DAY - 10/25/73

Haze and light fog for the morning of the 25th were found along the coastal areas; however, visibility conditions inland toward Burbank and central Los Angeles were 10 miles or better. Skies were clear, and some haze or obscuration developed over most of the Los Angeles basin for the remainder of the day.

Both LAX and El Monte radiosonde records indicated a surface based inversion with a top above 900 meters (a.g.l.). The 1130 PDT release at LAX showed that surface heating had now raised the base slightly to 147 meters with a second weaker base existing near 357 meters.

Lidar returns for the morning all indicated the presence of haze with scattering and attenuation extending from 183 to 625 meters (a.g.l.). Beginning at the launch site at 0743 PDT, the typical air mass discontinuity was detected just above the local inversion height, or 350 meters. Time separation between radiosonde releases prevented any meaningful comparison. However, the temperature profile obtained with the release from the 7th and Alameda launch site, at 0641 PDT, showed the possibility of a second level inversion base developed at around 300 meters. The existence of this second inversion base was revealed in the 1130 PDT release from LAX.

Lidar observations from points west and north from the downtown launch site indicated height variations of the mixing layer depth. No significant echoes were received from the vicinity of the lower inversion base at 147 meters.

Chart 21. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 11 10/25/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600	Sfc	800	280	310	Sfc	1016	397	497	0.2	Sfc	588	none		
0700									0.5					550-625
0800									0.5					525-575
0900									0.8					300-400
1000	none		none						2.0					300-400
1100									3.0					400-500
1200					147 357	208 586	357	467	3.0	Equipment Failure				350-400
1300									3.0					300-375
1400									8.0					350-450
1500									8.0					
1600									8.0					

NOTE I_b Inversion base (meters)

I_t Inversion top (meters)

DP_b Lower altitude of gradient change in dewpoint (meters)

DP_t Upper altitude of gradient change in dewpoint (meters)

Vsb Visibility at the surface (miles)

MLH Mixing layer height (meters)

Chart 22. SUMMARY OF OPERATION

MISSION DAY 10/25/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	Y	REMARKS
0740			24	59	Launch site "A" Downtown L.A.
0744	*		"	"	
0745	*		"	"	
0748	*		"	"	
0750	*		"	"	
0752	*		"	"	
0754		*	"	"	
0808	*		"	"	
0810	*		"	"	
0813	*		"	"	
0820	*		"	"	
0821		*	"	"	
0849	*		27	50	South Gate
0853	*		"	"	
0855		*	"	"	
0858	*		"	"	
0900	*		"	"	
0902	*		"	"	
0905	*		"	"	
0906	*		"	"	
0908	*		"	"	
0909		*	"	"	
0957	*		10	59	Santa Monica Fwy. & La Cienega, North of Culver City.
0959	*		"	"	
0961		*	"	"	
1004	*		"	"	
1007	*		"	"	
1008		*	"	"	
1023	*		6	61	W. Los Angeles
1025	*		"	"	
1026		*	"	"	
1030	*		"	"	
1034	*		"	"	
1035		*	"	"	
1043	*		"	"	
1046		*	"	"	
1149	*		18	65	Hollywood Fwy. & Normandie, L.A.
1152	*		"	"	
1153		*	"	"	

Chart 22 (continued). SUMMARY OF OPERATION

MISSION DAY 10/25/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	X	REMARKS
1158	*		18	65	
1201	*		"	"	
1202		*	"	"	
1206	*		"	"	
1210	*		"	"	
1214	*		"	"	
1216	*		"	"	
1217		*	"	"	
1243	*		19	68	Griffith Park
1246	*		"	"	
1247		*	"	"	
1250	*		"	"	
1253	*		"	"	
1254		*	"	"	
1314	*		25	70	Eagle Rock, Ventura Fwy. & Verdugo.
1318	*		"	"	
1321		*	"	"	
1404	*		32	69	Two miles Southwest of Universal City.
1407	*		"	"	
1408		*	"	"	
1411	*		"	"	
1415	*		"	"	
1417	*		"	"	
1419	*		"	"	
1421		*	"	"	
1423	*		"	"	
1424	*		"	"	
1425	*		"	"	
1426		*	"	"	
1630					Arrived @ Lidar Base

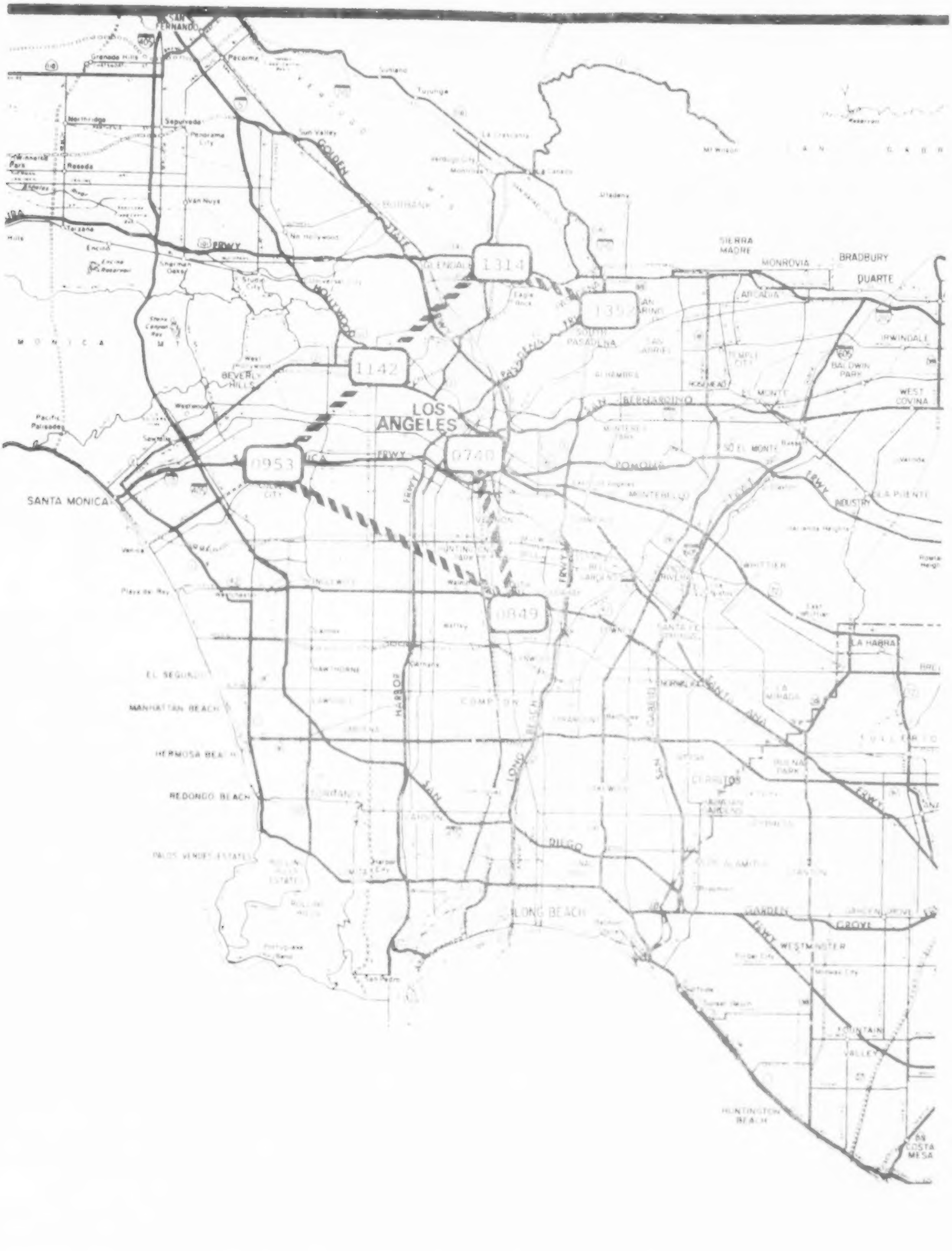

1314
1352
1142
0740
0953
0849
LOS ANGELES
SANTA MONICA
GLENDALE
BEVERLY HILLS
SOUTH PASADENA
MONROVIA
BRADBURY
DUARTE
ARCADIA
SIERRA MADRE
IRWINDALE
BALDWIN PARK
WEST COVINA
EL MONTE
MONTEBELLO
WHITTIER
LA HABRA
COMPTON
LONG BEACH
CERRITOS
WESTMINSTER
HUNTINGTON BEACH
COSTA MESA
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
SAN FERNANDO
Granada Hills
Northridge
Sepulveda
Panorama City
Pacoima
Sun Valley
Tujunga
La Crescenta
Burbank
Van Nuys
Reseda
Tarzana
Encino
Sherman Oaks
Pacific Palisades
Hawthorne
Carson
Torrance
Garden Grove
Fountain Valley
Mt Wilson
Altadena
Pasadena
Alhambra
Temple City
Rosemead
Industry
La Puente
La Mirada
Buena Park
Los Alamitos
Cypress
Bellflower
Paramount
Norwalk
Downey
Santa Fe Springs
Pico Rivera
South El Monte
Vernon
Huntington Park
Inglewood
Westchester
Culver City
Venice
Playa del Rey
San Pedro
Palos Verdes Estates
Rolling Hills
Harbor City
Seal Beach
Sunset Beach
Midway City
Golden State
Hollywood
Pasadena Frwy
Harbor Frwy
Santa Ana Frwy
San Bernardino
Pomona
Long Beach
San Diego
San Gabriel
Ventura Frwy
Santa Monica Mts
Garden Grove Frwy

Figure 26. Mobile Lidar route map
Mission day 10/25/73

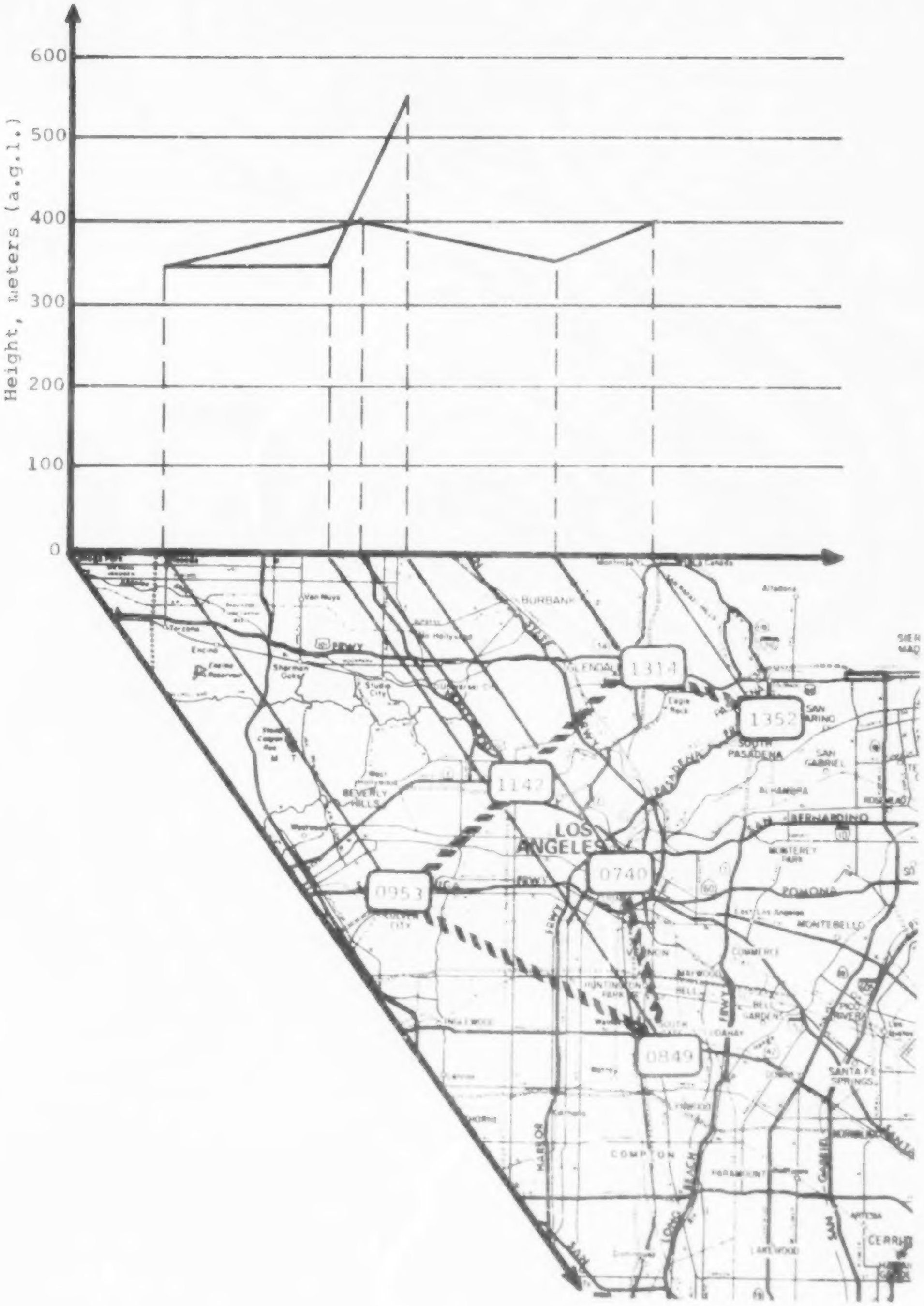


Figure 27. Mixing layer height along observational route
Mission day 10/25/73

MISSION DAY - 10/26/73

On the morning of the 26th, ground fog and haze existed until approximately 0900 PDT. Discontinuities in the Lidar backscatter indicated a horizontal layering at approximately 250-350 meters altitude. Radiosonde data from the early morning release (0539 PDT) revealed a fairly uniform moisture profile extending to above 610 meters. In existence at this time was an elevated inversion with base and top of 318 meters and 787 meters respectively. The backscatter data revealed the haze extended to just below the inversion base altitude.

The 1130 radiosonde data revealed ground and air temperatures increased along with an influx of moist air from the coast. The marine layer was observed to progressively get shallower during the morning, and was characterized by a lowering of the inversion base to 257 meters. This was accompanied by a subsequent lowering of the top to 379 meters. A reduced temperature gradient was also noted which could account for the slightly greater altitude dispersion in Lidar backscatter. Backscatter from this altitude fluctuated over a 76 meter range, indicating only minor variability with distance or time.

After 1330 PDT, when the Lidar van was in North Long Beach, Lidar signals decreased in both magnitude and position of indicated mixing depth. This change in signal strength may have been in part due to an increase in observed low level haze, an additional attenuating mechanism. Nevertheless, a downward shift was noted for the upper limit of scattering by any layers present.

Chart 23. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 12 10/26/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600					318	787	629	787	2.5	278	737	249	347	
0700									1.0					
0800	110	370	110	750					1.5					
0900									2.5					250-350
1000									2.5					250-300
1100									2.5					225-300
1200					257	379	257	379	2.5					200-250
1300									3.0	none		298	329	200-300
1400									3.0					200-250
1500									3.0					200-250
1600														

NOTE I_b Inversion base (meters)
I_t Inversion top (meters)
DP_b Lower altitude of gradient change in dewpoint (meters)
DP_t Upper altitude of gradient change in dewpoint (meters)
Vsb Visibility at the surface (miles)
MLH Mixing layer height (meters)

Chart 24. SUMMARY OF OPERATION

MISSION DAY 10/26/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	Y	
0730					Left Lidar Base
0850			24	59	Launch site "A" Downtown L.A.
0902	*		"	"	
0905	*		"	"	
0906	*		"	"	
0909	*		"	"	
0913	*		"	"	
0917	*		"	"	
0927	*		"	"	
0935	*		"	"	
0936		*	"	"	
0944	*		"	"	
0950	*		"	"	
0952	*		"	"	
0957	*		"	"	
0959		*	"	"	
1000			"	"	Launch - Lidar left Site
1026	*		"	"	
1034	*		"	"	
1039	*		"	"	
1040	*		"	"	
1045		*	"	"	
1108	*		11	54	Culver City, La Cienega & Slauson.
1115		*	"	"	
1116	*		"	"	
1119	*		"	"	
1120	*		"	"	
1124	*		"	"	
1125	*		"	"	
1126		*	"	"	
1130	*		"	"	
1131	*		"	"	
1133	*		"	"	
1134	*		"	"	
1135		*	"	"	
1222	*		28	36	Long Beach
1226	*		"	"	
1227		*	"	"	
1231	*		"	"	
1232		*	"	"	

Chart 24 (continued). SUMMARY OF OPERATION

MISSION DAY 10/26/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	X	
1304	*		28	39	North Long Beach, Atlantic & South.
1311	*		"	"	
1312	*		"	"	
1316	*		"	"	
1320	*		"	"	
1321	*		"	"	
1322		*	"	"	
1335	*		29	40	N. Long Beach
1336	*		"	"	
1338	*		"	"	
1339		*	"	"	
1343	*		"	"	
1346	*		"	"	
1347	*		"	"	
1348		*	"	"	
1435	*		46	51	E. Whittier
1436	*		"	"	
1441	*		"	"	
1442		*	"	"	
1444	*		"	"	
1448	*		"	"	
1450	*		"	"	
1454	*		"	"	
1455	*		"	"	
1458	*		"	"	
1501	*		"	"	
1502	*		"	"	
1503		*	"	"	
1527	*		49	46	La Habra, Imperial & Beach Blvd.
1528	*		"	"	
1530	*		"	"	
1531	*		"	"	
1535	*		"	"	
1539	*		"	"	
1540	*		"	"	
1542	*		"	"	
1553	*		"	"	
1555	*		"	"	
1558	*		"	"	
1560		*	"	"	
1845					Arrived @ Lidar Base.

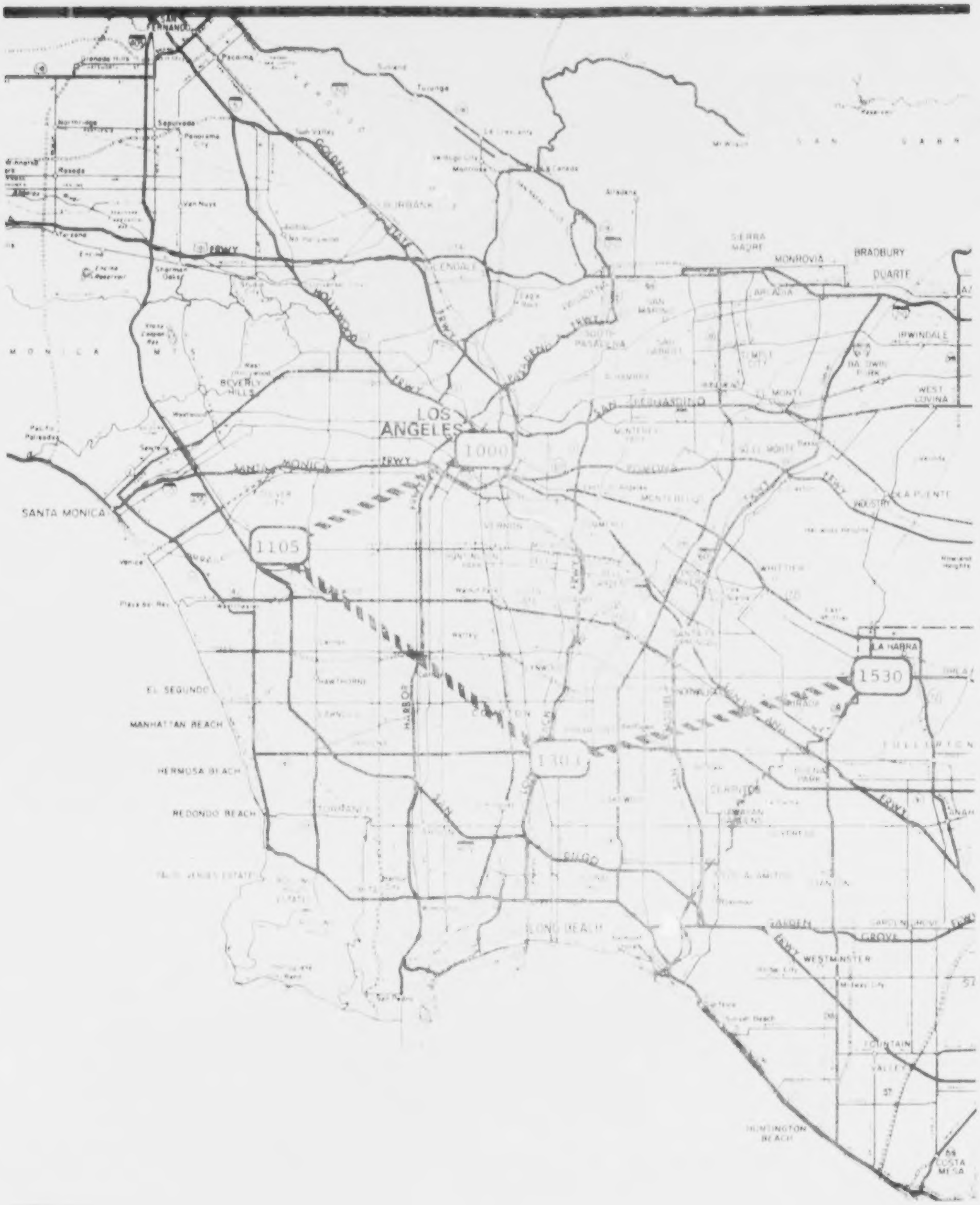

1000
1105
1301
1530
LOS ANGELES
SANTA MONICA
BEVERLY HILLS
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
LONG BEACH
LA HABRA
MONROVIA
BRADBURY
DUARTE
IRWINDALE
WEST COVINA
LA PUENTE
SIERRA MADRE
WESTMINSTER
HUNTINGTON BEACH
COSTA MESA
SANTA MONICA FRWY
SAN BERNARDINO
FULLERTON
GARDEN GROVE
FOUNTAIN VALLEY

Figure 28. Mobile Lidar route map
Mission day 10/26/73

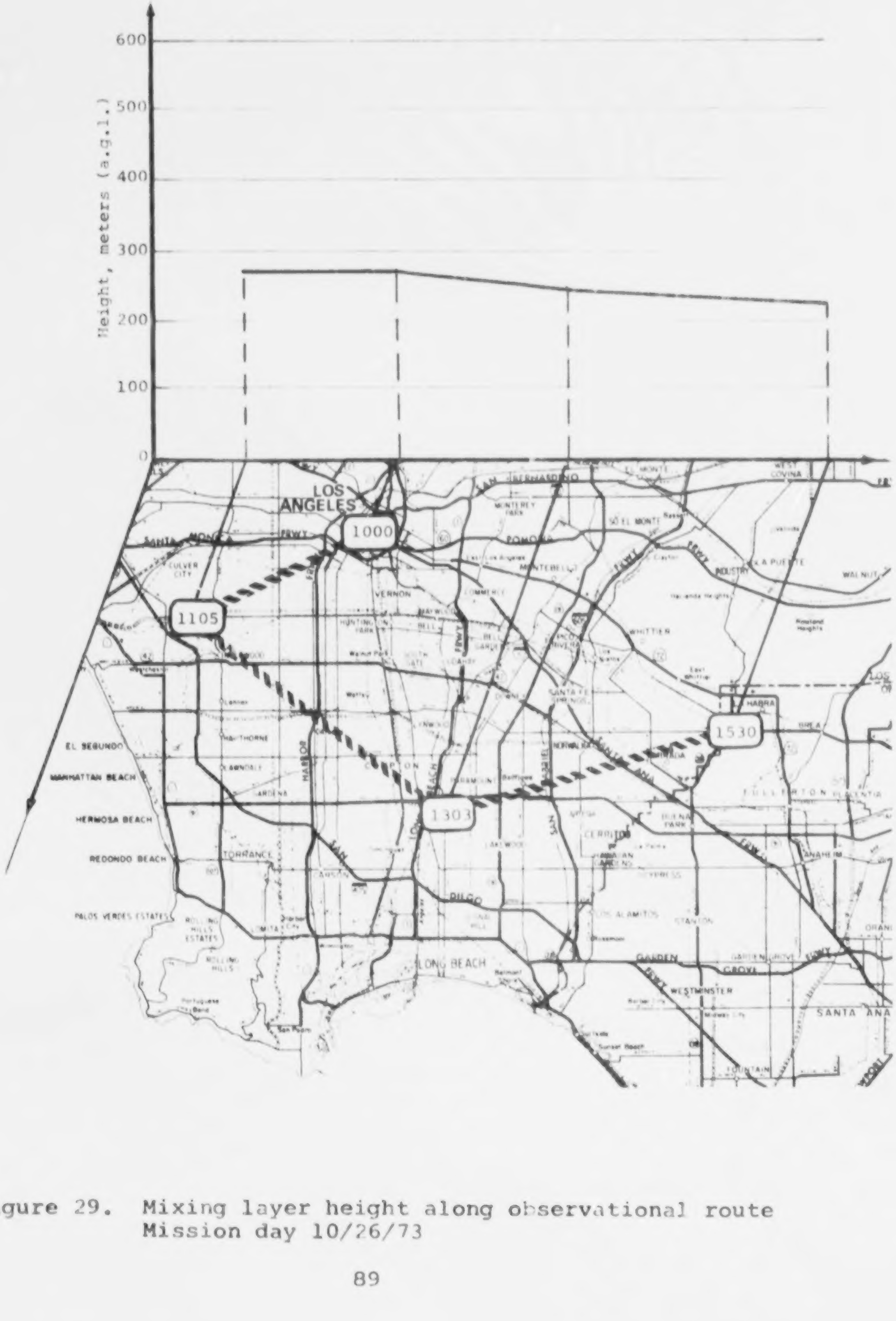


Figure 29. Mixing layer height along observational route Mission day 10/26/73

MISSION DAY - 10/27/73

The meteorological conditions for the 27th and during the next three days, were typical for those encountered during a foehn flow or Southern California Santa Ana. Early morning temperatures were in the middle 50's throughout the basin but climbed quickly to the 90's just a short distance inland from the coast. Humidity values also decreased markedly before midday reaching 13% even in Long Beach. Radiosonde data from 0548 PDT indicated the presence of a ground-based or near-surface inversion base with top of around 467 meters (a.g.l.). A strong humidity gradient was present just above the surface with exceptionally dry air noted above 104 meters. This level of dry air remained practically unchanged throughout the day. The late morning temperature profile showed a reversal of the temperature structure to near neutral condition.

Lidar returns for the entire day revealed a characteristic signature typical for an atmosphere having a low optical extinction. All returns prior to 12 noon indicated the presence of a low level (60 meters) inversion. The magnitude of the gradient indicated by this trapping increased through the morning reaching a maximum between 1030 and 1100 PDT. This condition was manifested in the Lidar raw data traces by backscatter intensity fluctuations increasing from 20 to 40% within the inversion altitude. Also apparent from the raw data signals was the existence of elevated scattering layers at approximately 549 and 850 meters (a.g.l.). These signals were transitory in nature, lasting only minutes each time, and were indicative of aerosols trapped within the boundary flows of upper level winds. The maximum mixing depth in the plot for the 27th was also indicative of the upper level reached by convected aerosols, and may not represent a true thermal boundary. The lower scattering levels (less than 76 meters) represent the actual inversion interface.

Other features of the Lidar data show only minor altitude differences of the scatter levels with distance, indicating a fairly uniform spatial flow or subsidence within the L.A. basin.

Chart 25. **COMPARISON** OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 13 10/27/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600	Sfc	570	Sfc	90	Sfc	467	Sfc	104	4.0	Equipment Failure				
0700									4.0					
0800									4.0					
0900									8.0					475-750
1000									14.0					475-650
1100									14.0					700-850
1200					none		Sfc	113	6.0					500-650
1300									8.0					500-600
1400									8.0					
1500									20.0					
1600														

NOTE I_b Inversion base (meters)
I_t Inversion top (meters)
DP_b Lower altitude of gradient change in dewpoint (meters)
DP_t Upper altitude of gradient change in dewpoint (meters)
Vsb Visibility at the surface (miles)
MLH Mixing layer height (meters)

Chart 26. SUMMARY OF OPERATION

MISSION DAY 10/27/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	Y	REMARKS
0700					Left Lidar Base
			24	59	Launch site "A" Downtown L.A.
0758	*		"	"	
0801	*		"	"	
0804	*		"	"	
0813		*	"	"	
0824	*		"	"	
0826	*		"	"	
0828	*		"	"	
0830	*		"	"	
0836	*		"	"	
0838		*	"	"	
0843	*		"	"	
0846	*		"	"	
0847		*	"	"	
0852	*		"	"	
0854	*		"	"	
0855	*		"	"	
0856	*		"	"	
0857	*		"	"	
0858	*		"	"	
0859		*	"	"	
0900			"	"	Launch
0928	*		15	57	Los Angeles
0930	*		"	"	
0931	*		"	"	
0932	*		"	"	
0933	*		"	"	
0934	*		"	"	
0938	*		"	"	
0939	*		"	"	
0941	*		"	"	
0943	*		"	"	
0944	*		"	"	
0946	*		"	"	
0947	*		"	"	
0948		*	"	"	
1029	*		32	50	Downey, Long Beach Fwy. & Firestone.
1033	*		"	"	
1034	*		"	"	
1035	*		"	"	

Chart 26 (continued). SUMMARY OF OPERATION

MISSION DAY 10/27/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	X	
1037	*		32	50	
1038	*		"	"	
1040	*		"	"	
1041	*		"	"	
1044	*		"	"	
1046	*		"	"	
1048	*		"	"	
1049	*		"	"	
1050	*		"	"	
1052		*	"	"	
1145	*		32	39	Lakewood
1147	*		"	"	
1149		*	"	"	
1216	*		27	30	Long Beach Harbor
1220	*		"	"	
1225	*		"	"	
1228	*		"	"	
1229	*		"	"	
1232	*		"	"	
1234	*		"	"	
1236	*		"	"	
1237		*	"	"	
1345					Arrived @ Lidar Base.

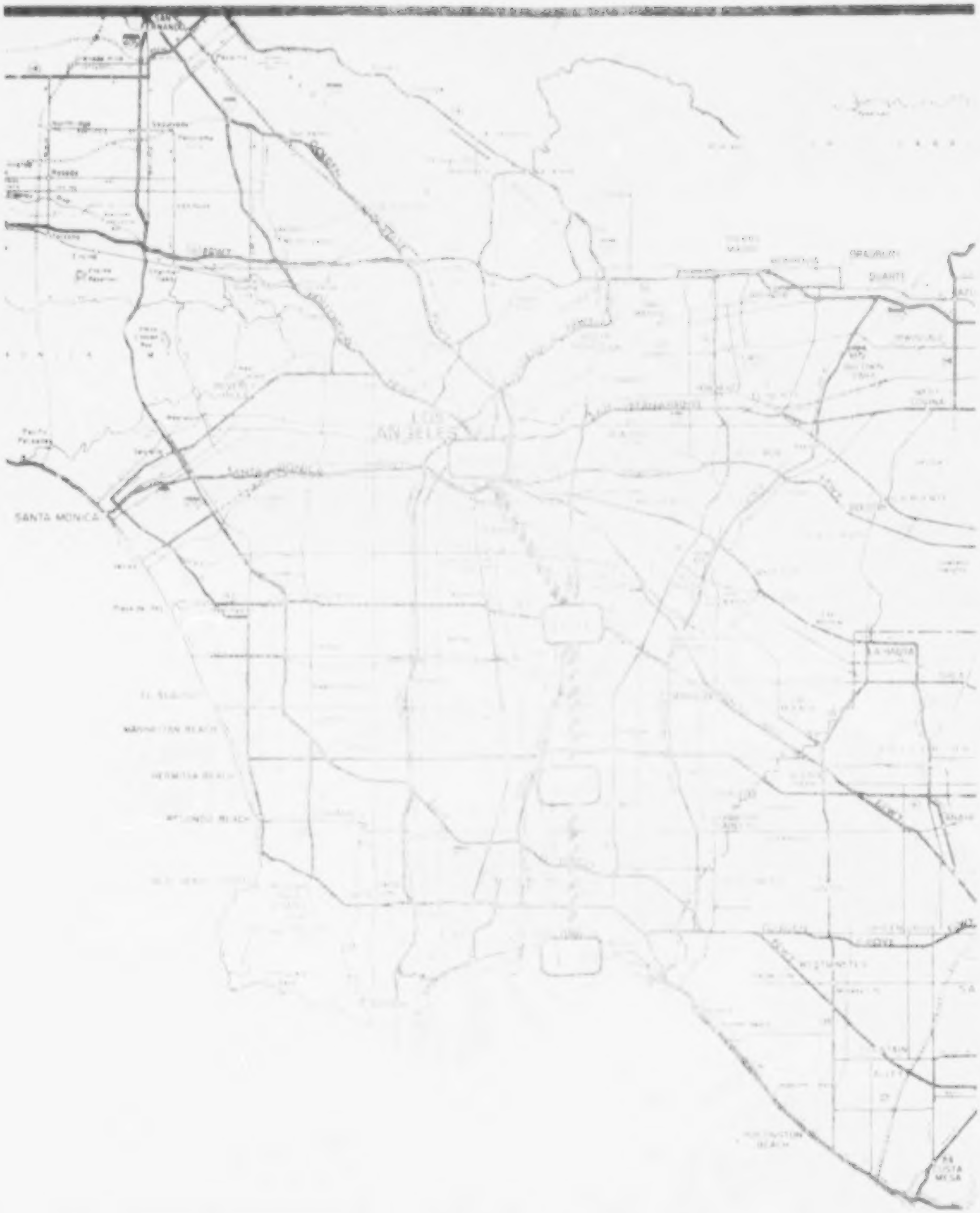

SANTA MONICA
LOS ANGELES

Figure 30. Mobile Lidar route map
Mission day 10/27/73

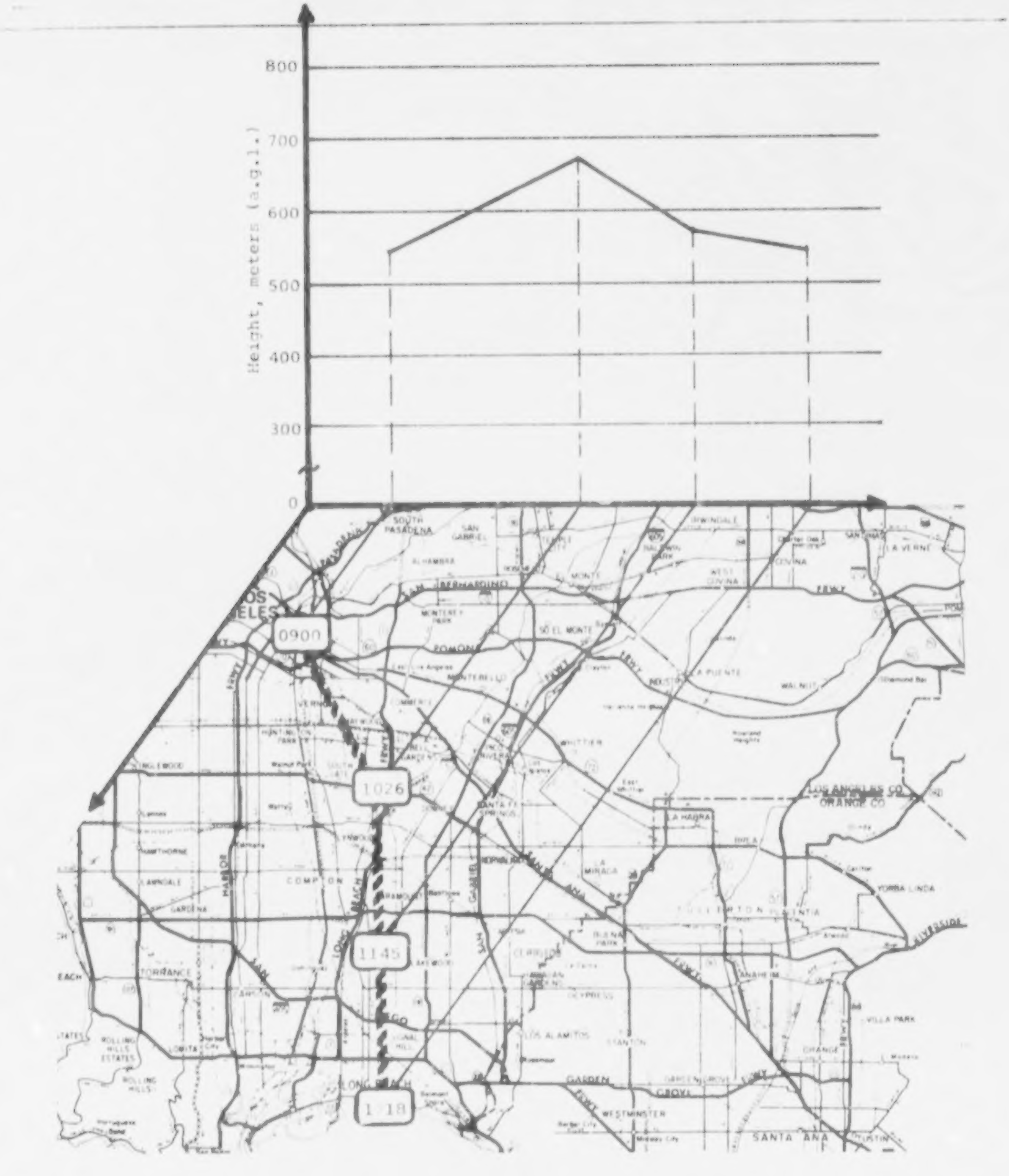


Figure 31. Mixing layer height along observational route
Mission day 10/27/73

MISSION DAY - 10/29/73

The conditions supporting a foehn flow were not as prevalent as for the 27th; however, the presence of low humidity values throughout the entire basin was indicative of the presence of dry air. The 0530 PST radiosonde profile for LAX and El Monte indicated a surface inversion with tops around 600 meters (a.g.l.) near the coast and mountains. The presence of very dry air near 90 meters (a.g.l.) at LAX indicated a strong gradient condition separating the boundary of the marine layer.

The temperature profile from the 1130 PST LAX radiosonde showed existence of an elevated inversion beginning at approximately 348 meters (a.g.l.) with near neutral conditions existing below that point.

Very detailed structures shown in the Lidar signatures were received for this day, indicative of particulate or air mass turbulence to heights of 732 meters (a.g.l.). The early morning (0740 PST) data indicated the presence of a possible thermal inversion near 82 meters (a.g.l.). This layer, or interface, remained at approximately the same altitude until the conclusion of the Lidar operation at 1318 PST. The upper boundary of high scattering changed from the 823 meters (a.g.l.) at 0742 PST to 500 meters (a.g.l.) at 1318 PST. Since near neutral lapse conditions prevailed over most of the day, mechanical turbulence may be responsible for the insertion of particulates at the upper boundary. This boundary was also marked by a weak temperature inversion which existed between 348 meters and 625 meters in the L.A. basin. Fluctuations in the height of this upper boundary were observed in the Lidar data. However, it was difficult to find reasons for this behavior through comparisons with either time or distance traveled.

Chart 27. **COMPARISON** OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 14 10/29/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600	Sfc	780	Sfc	170	Sfc	168	Sfc	83	20	Sfc	518	Sfc	30	
0700									20					700-900
0800									12					700-900
0900									6					500-650
1000									6					550-700
1100									8					500-650
1200					348	629	Sfc	98	8					500-650
1300									8	none		none		500-650
1400									8					
1500									10					
1600														

NOTE	I_b	Inversion base (meters)
	I_t	Inversion top (meters)
	DP_b	Lower altitude of gradient change in dewpoint (meters)
	DP_t	Upper altitude of gradient change in dewpoint (meters)
	Vsb	Visibility at the surface (miles)
	MLH	Mixing layer height (meters)

Chart 28. SUMMARY OF OPERATION

MISSION DAY 10/29/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	Y	
0630					Left Lidar Base
0725			31	47	Launch Site "J" Downey
0743	*		"	"	
0745	*		"	"	
0747	*		"	"	
0750	*		"	"	
0751	*		"	"	
0754	*		"	"	
0756		*	"	"	
0801	*		"	"	
0805	*		"	"	
0806	*		"	"	
0810	*		"	"	
0811	*		"	"	
0815	*		"	"	
0816	*		"	"	
0819	*		"	"	
0825	*		"	"	
0826	*		"	"	
0827	*		"	"	
0828		*	"	"	
0830			"	"	Launch
0848	*		20	47	Los Angeles
0851	*		"	"	
0852	*		"	"	
0854	*		"	"	
0855		*	"	"	
0901	*		"	"	
0903	*		"	"	
0904	*		"	"	
0905		*	"	"	
0930	*		22	59	Los Angeles
0931	*		"	"	
0932	*		"	"	
0937	*		"	"	
0938		*	"	"	
0941	*		"	"	
0944	*		"	"	
0945	*		"	"	
0949	*		"	"	
0954	*		"	"	
0955	*		"	"	

Chart 28 (continued). SUMMARY OF OPERATION

MISSION DAY 10/29/73

	LIDAR		L.A. BASIN GRID POSITION COORDINATES		
TIME	ON	OFF	X	X	REMARKS
0958	*		22	59	
1000	*		"	"	
1001		*	"	"	
1037	*		25	66	North of Elysian Park on San Fernando Drive.
1041	*		"	"	
1043	*		"	"	
1044	*		"	"	
1045	*		"	"	
1046		*	"	"	
1052	*		"	"	
1055	*		"	"	
1056		*	"	"	
1104	*		"	"	
1107	*		"	"	
1108	*		"	"	
1113	*		"	"	
1115	*		"	"	
1116		*	"	"	
1135	*		"	"	
1137	*		"	"	
1139	*		"	"	
1144	*		"	"	
1147	*		"	"	
1148		*	"	"	
1155	*		"	"	
1200	*		"	"	
1205	*		"	"	
1210	*		"	"	
1213	*		"	"	
1214		*	"	"	
1236	*		39	63	Rosemead; San Bernardino Fwy. & Rosemead Blvd.
1243	*		"	"	
1244	*		"	"	
1247	*		"	"	
1248		*	"	"	
1251	*		"	"	
1254	*		"	"	
1256	*		"	"	
1302	*		"	"	
1304	*		"	"	
1306	*		"	"	

Chart 28 (continued). SUMMARY OF OPERATION

MISSION DAY 10/29/73

TIME	LIDAR ON	OFF	L.A. BASIN GRID POSITION COORDINATES X	X	REMARKS
1308	*		39	63	
1311	*		"	"	
1313	*		"	"	
1315	*		"	"	
1317	*		"	"	
1318	*		"	"	
1319		*	"	"	
1545					Arrived @ Lidar Base

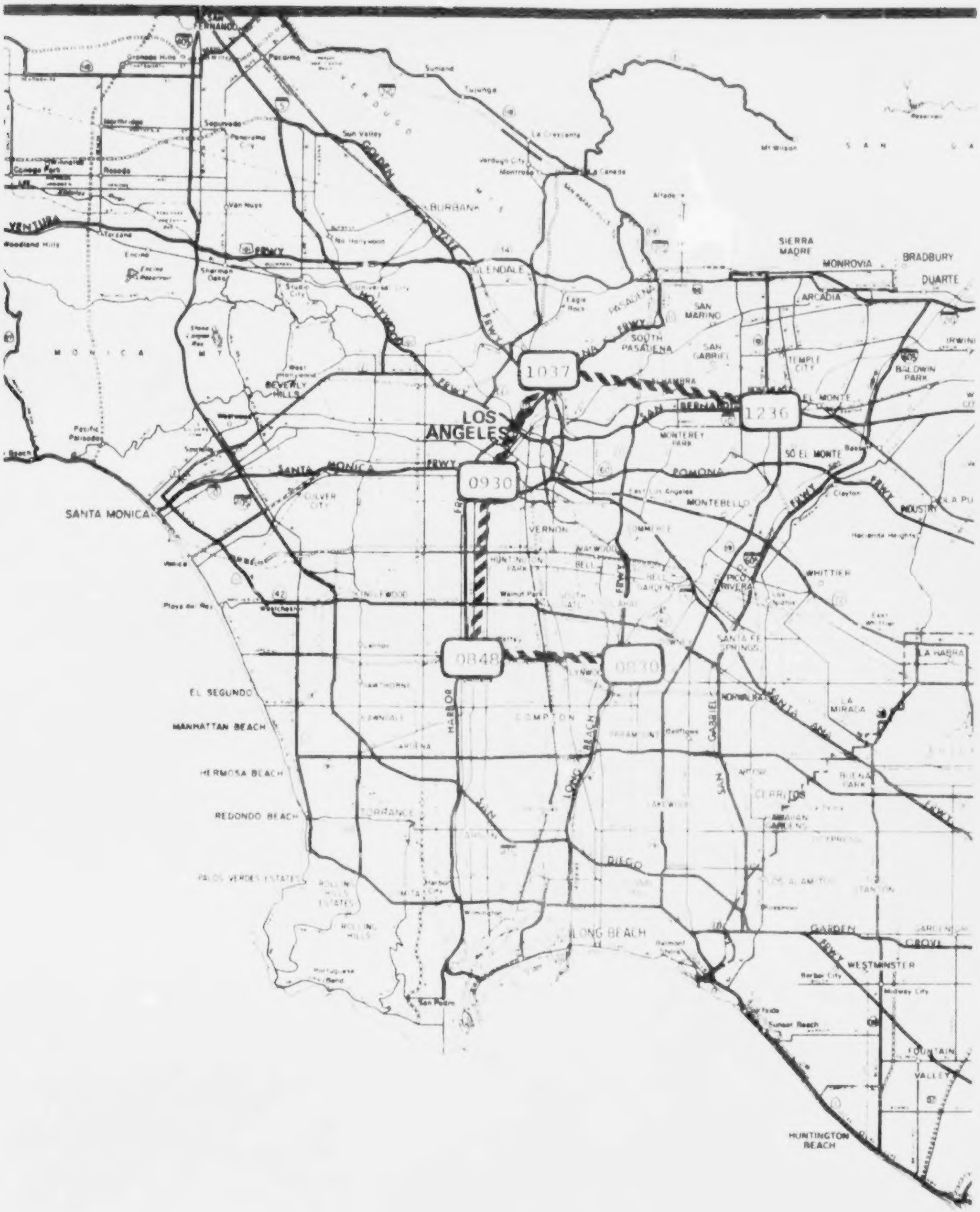

1037
1236
0930
0848
0930
LOS ANGELES
BURBANK
GLENDALE
PASADENA
SOUTH PASADENA
SAN MARINO
SAN GABRIEL
SIERRA MADRE
MONROVIA
BRADBURY
DUARTE
ARCADIA
TEMPLE CITY
EL MONTE
SO EL MONTE
BALDWIN PARK
MONTEREY PARK
MONTEBELLO
POMONA
SAN BERNARDINO
VENTURA
GOLDEN
HOLLYWOOD
SANTA MONICA
FRWY
BEVERLY HILLS
CULVER CITY
VERNON
HUNTINGTON PARK
BELL
WHITTIER
SANTA FE SPRINGS
LA HABRA
LA MIRADA
NORWALK
SANTA ANA
INGLEWOOD
HAWTHORNE
COMPTON
HARBOR
LONG BEACH
SAN GABRIEL
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
TORRANCE
SAN DIEGO
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
ROLLING HILLS
CERRITOS
BUENA PARK
STANTON
GARDEN GROVE
WESTMINSTER
FOUNTAIN VALLEY
HUNTINGTON BEACH

Figure 32. Mobile Lidar route map
Mission day 10/29/73

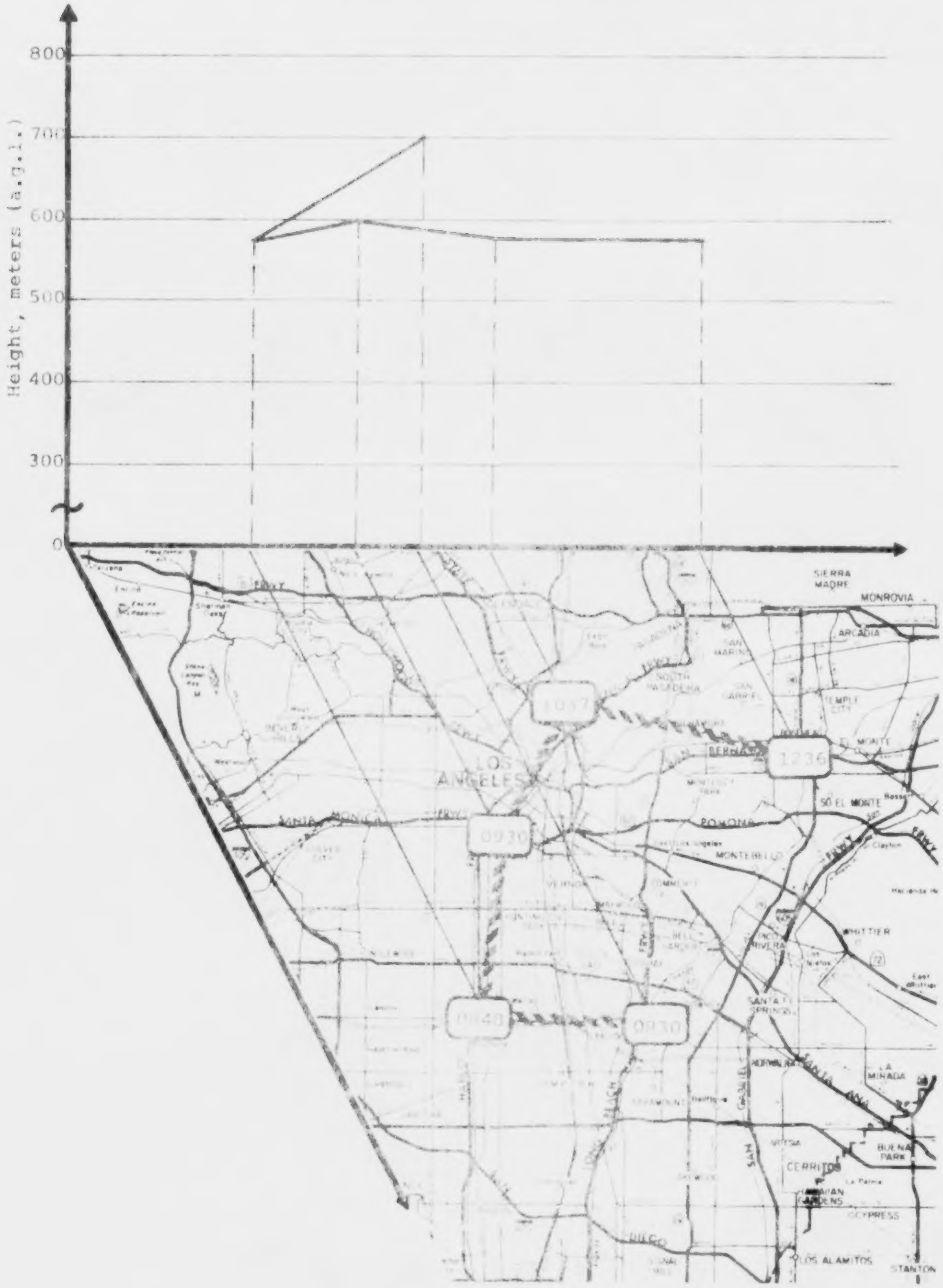


Figure 33. Mixing layer height along observational route
Mission day 10/29/73

MISSION DAY - 10/30/73

Ground level meteorological conditions for the 30th were similar to the previous two days except that stronger low level winds from the southeast were present. A surface inversion was reported at 0550 PST with tops at 287 meters (a.g.l.) extending to 347 meters (a.g.l.) in the eastern section of the Los Angeles basin. Daytime temperatures increased on the ground, changing the stable conditions to superadiabatic around noon. Again, a significant gradient in moisture concentration at less than 30 meters (a.g.l.) was indicated in all radiosonde releases for the day, with extreme dryness aloft.

The conditions indicating turbulent mixing aloft were manifested in the Lidar returns by the random scattering occurring at extremely high altitudes (732-1200 meters). Detection of the lower thermal inversion was again evident in the early morning returns. Some degree of layer breakup was noted here before noon. The conditions of stronger ground level winds together with vertical convection could probably destroy any structure features. Numerous random echoes from transient layers were also noted existing in the raw Lidar data. Although an upper level was detected, this mixing layer was more indicative of the buildup of turbulent layer. The unique characteristic of the Lidar signature signifying this was evident in the extinction or slope of the return versus range.

Chart 29. **COMPARISON** OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 15 10/30/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600	Sfc	80	Sfc	80	Sfc	287	none		10	Sfc	347	Sfc	30	
0700									6					1000-1100
0800									6					1100-1200
0900									8					700-875
1000									6					500-700
1100									5					600-900
1200					none		none		7					
1300									12					
1400									14					
1500									20					
1600														

NOTE I_b Inversion base (meters)
I_t Inversion top (meters)
DP_b Lower altitude of gradient change in dewpoint (meters)
DP_t Upper altitude of gradient change in dewpoint (meters)
Vsb Visibility at the surface (miles)
MLH Mixing layer height (meters)

Chart 30. SUMMARY OF OPERATION

MISSION DAY 10/30/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	Y	
0630					Left Lidar Base
0731	*		31	47	Launch Site "J" Downey
0733	*		"	"	
0735	*		"	"	
0738	*		"	"	
0741	*		"	"	
0742		*	"	"	
0748	*		"	"	
0750	*		"	"	
0751	*		"	"	
0754	*		"	"	
0755	*		"	"	
0758	*		"	"	
0800		*	"	"	
0813	*		"	"	
0814	*		"	"	
0818	*		"	"	
0819	*		"	"	
0820	*		"	"	
0822	*		"	"	
0823	*		"	"	
0826	*		"	"	
0827	*		"	"	
0828	*		"	"	
0829		*	"	"	
0830			"	"	Launch
0933	*		45	44	La Mirada, Rosecrans & La Mirada
0937	*		"	"	
0938	*		"	"	
0940	*		"	"	
0946	*		"	"	
0947	*		"	"	
0949	*		"	"	
0951	*		"	"	
0952		*	"	"	
1025	*		26	38	North Long Beach, Long Beach Fwy. & Del Amo.
1026	*		"	"	
1028	*		"	"	
1030	*		"	"	
1033	*		"	"	
1034	*		"	"	

Chart 30 (continued). SUMMARY OF OPERATION

MISSION DAY 10/30/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	 X	REMARKS
1035	*		26	38	
1036	*		"	"	
1038		*	"	"	
1042	*		"	"	
1044	*		"	"	
1045		*	"	"	
1047	*		"	"	
1049	*		"	"	
1052	*		"	"	
1053	*		"	"	
1054	*		"	"	
1056	*		"	"	
1058	*		"	"	
1100	*		"	"	
1102	*		"	"	
1103	*		"	"	
1105		*	"	"	
1655					Arrived @ Lidar Base

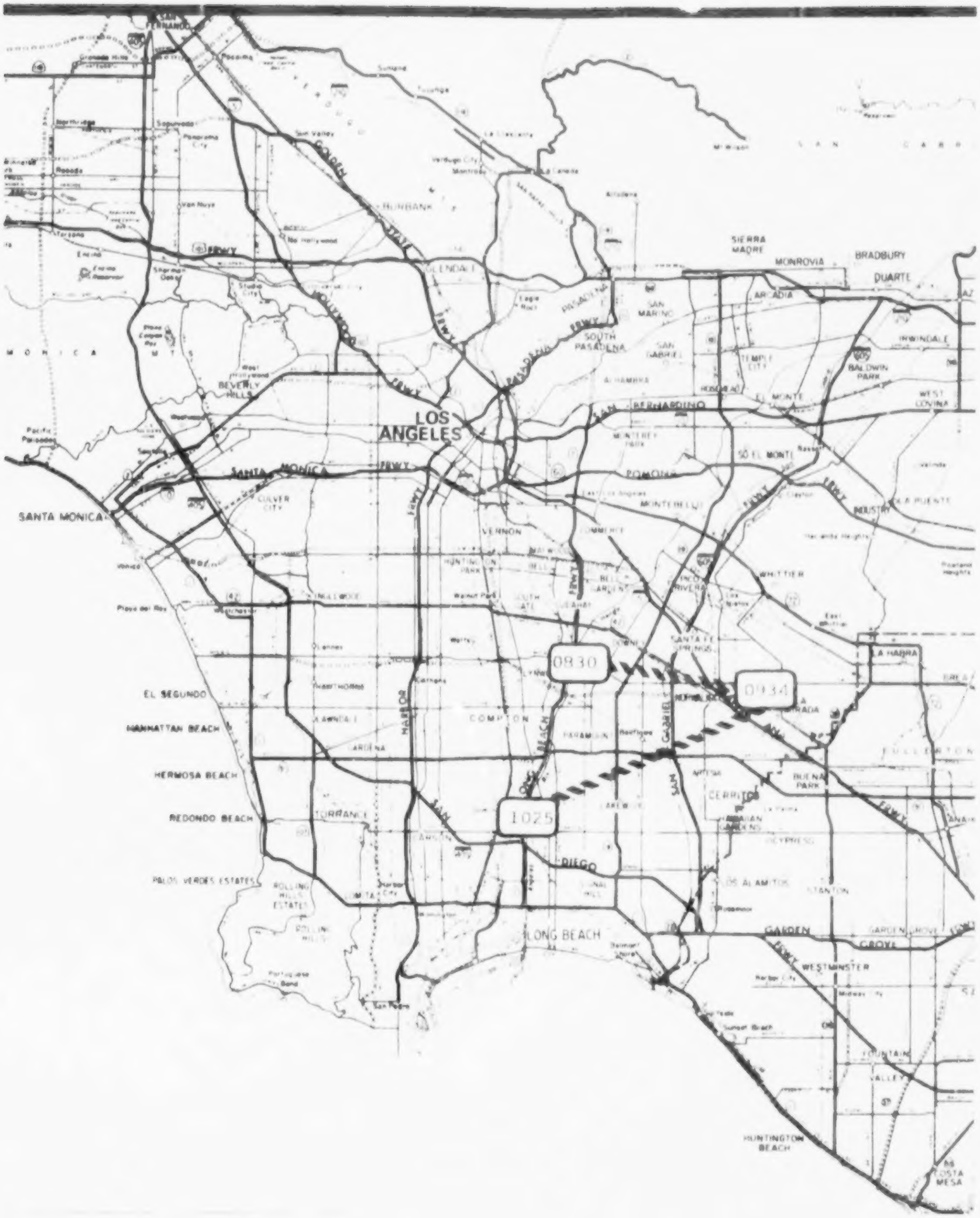

0830
0934
1025
LOS ANGELES
SANTA MONICA
BEVERLY HILLS
CULVER CITY
GLENDALE
BURBANK
PASADENA
SOUTH PASADENA
SAN MARINO
SAN GABRIEL
ALHAMBRA
TEMPLE CITY
ARCADIA
SIERRA MADRE
MONROVIA
BRADBURY
DUARTE
IRWINDALE
BALDWIN PARK
WEST COVINA
EL MONTE
MONTEREY PARK
MONTEBELLO
SO EL MONTE
LA PUENTE
INDUSTRY
VERNON
HUNTINGTON PARK
COMMERCE
BELL GARDENS
PICO RIVERA
WHITTIER
SANTA FE SPRINGS
LA HABRA
LA MIRADA
BUENA PARK
CERRITOS
COMPTON
PARAMOUNT
LAKEWOOD
GARDENA
HAWTHORNE
INGLEWOOD
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
TORRANCE
CARSON
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
ROLLING HILLS
LONG BEACH
LOS ALAMITOS
STANTON
GARDEN GROVE
WESTMINSTER
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA
SANTA MONICA FRWY
SAN BERNARDINO
POMONA
HARBOR
SAN DIEGO
SAN GABRIEL
GOLDEN STATE
HOLLYWOOD
SAN FERNANDO
SAN GABRIEL
MONICA

Figure 34. Mobile Lidar route map
Mission day 10/30/73

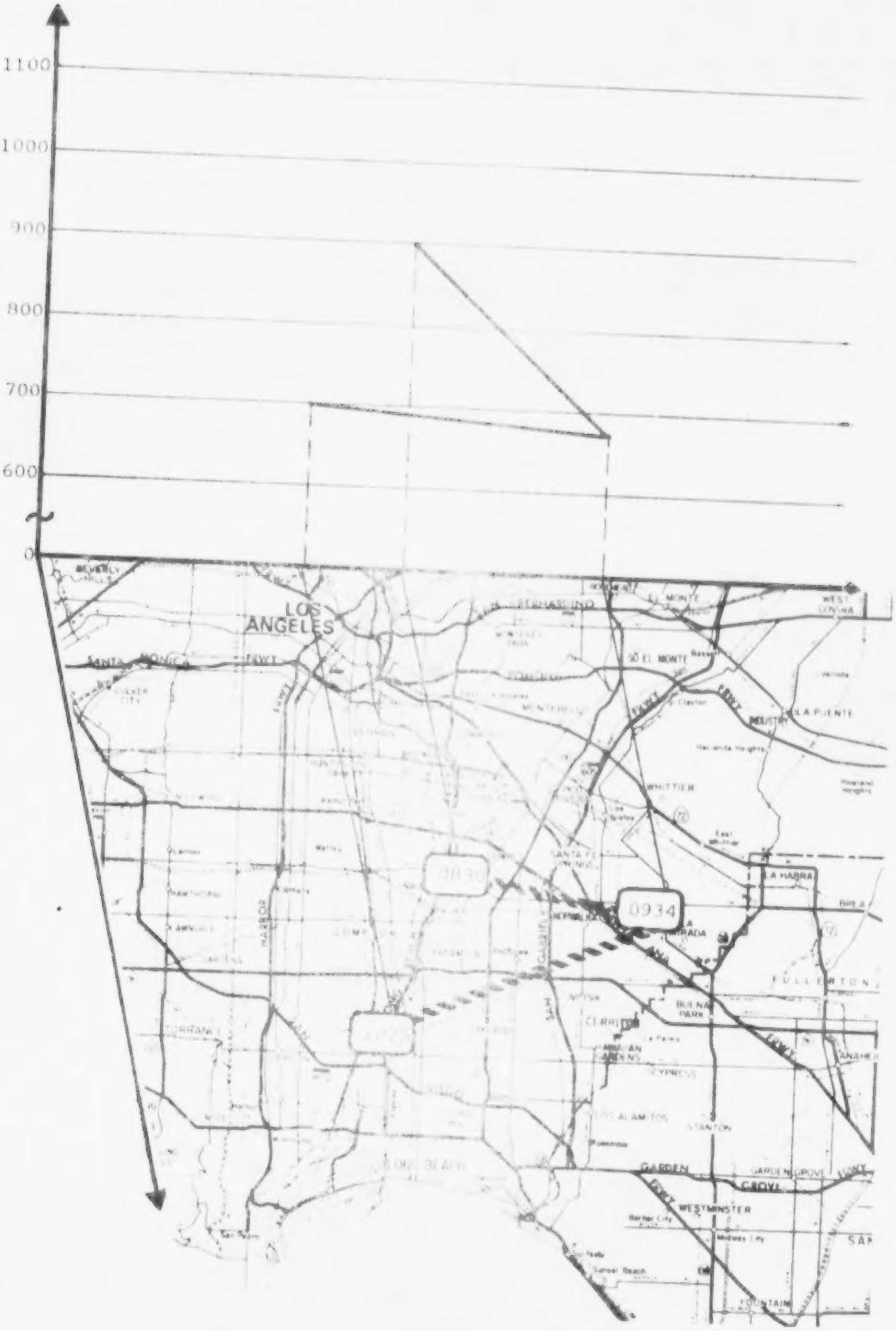


Figure 35. Mixing layer height along observational route Mission day 10/30/73

MISSION DAY - 10/31/73

The effects of the previous three days of Santa Ana conditions may have contributed to the good visibility and low haze reported on the morning of the 31st. Wind components above 305 meters, however, indicated convergence of air from the north and northwest directions as detected by the 1130 PST radiosonde from LAX. This represents a reversal from the previous day's soundings.

A ground-based inversion existed during the morning hours but moved upward to 77 meters along the coastal regions before noon. Higher surface temperatures inland may have contributed to the high inversion base altitude of 628 meters over El Monte at 1335 PST. Surface winds over most of the Los Angeles basin returned to a typical sea breeze condition after 12 noon.

Lidar returns from the 7th and Alameda location, indicated the presence of layered aerosol structure at approximately the height of the reported inversion base. Records later that morning, from observation points due west, showed a gradual disappearance of echoes from this altitude. Considerable layering was evident throughout the region from 200 through 450 meters. Many of the signal echoes were transitory in nature.

The slope of the inversion base, lying between LAX and El Monte, could well have occurred within the altitude region being detected by the Lidar. Some indications from wind data as well revealed wind shears within the region between 305 and 457 meters (a.g.l.). A likely mechanism could be that the residual pollution was trapped by wind shears.

Chart 31. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 16 10/31/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600					Sfc	397	none		15	Sfc	384	Sfc	42	
0700	none								14					
0800									12					350-475
0900									12					350-475
1000									10					300-450
1100									10					400-500
1200					77	357/568	98	150	10					
1300									10	628	829	none		
1400									10					
1500									10					
1600														

NOTE I_b Inversion base (meters)

I_t Inversion top (meters)

DP_b Lower altitude of gradient change in dewpoint (meters)

DP_t Upper altitude of gradient change in dewpoint (meters)

Vsb Visibility at the surface (miles)

MLH Mixing layer height (meters)

Chart 32. SUMMARY OF OPERATION

MISSION DAY 10/31/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	Y	
0630					Left Lidar Base
0745			24	59	Arrived @ Launch site "A" Downtown L.A.
0800	*		"	"	
0802	*		"	"	
0804	*		"	"	
0807	*		"	"	
0808	*		"	"	
0811	*		"	"	
0814	*		"	"	
0815	*		"	"	
0817	*		"	"	
0819	*		"	"	
0820	*		"	"	
0821	*		"	"	
0823	*		"	"	
0825	*		"	"	
0827	*		"	"	
0830	*		"	"	Launch
0831		*	"	"	
0835					Leave site "A"
0854	*		14	60	Los Angeles
0856	*		"	"	
0858	*		"	"	
0901	*		"	"	
0902		*	"	"	
0904	*		"	"	
0906	*		"	"	
0908	*		"	"	
0912	*		"	"	
0917	*		"	"	
0918		*	"	"	
0940	*		5	56	Mar Vista, Venice Blvd. & Centinela.
0942	*		"	"	
0944	*		"	"	
0948	*		"	"	
0952	*		"	"	
0956	*		"	"	
0959	*		"	"	
1001	*		"	"	
1004	*		"	"	
1005		*	"	"	

Chart 32 (continued). SUMMARY OF OPERATION

MISSION DAY 10/31/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	L.A. BASIN GRID POSITION COORDINATES Y	REMARKS
1008	*		5	56	
1010	*		"	"	
1012	*		"	"	
1015	*		"	"	
1016		*	"	"	
1044	*		"	53	
1045	*		"	"	
1047	*		"	"	
1049	*		"	"	
1053	*		"	"	
1055	*		"	"	
1056		*	"	"	
1315					Arrived @ Lidar Base

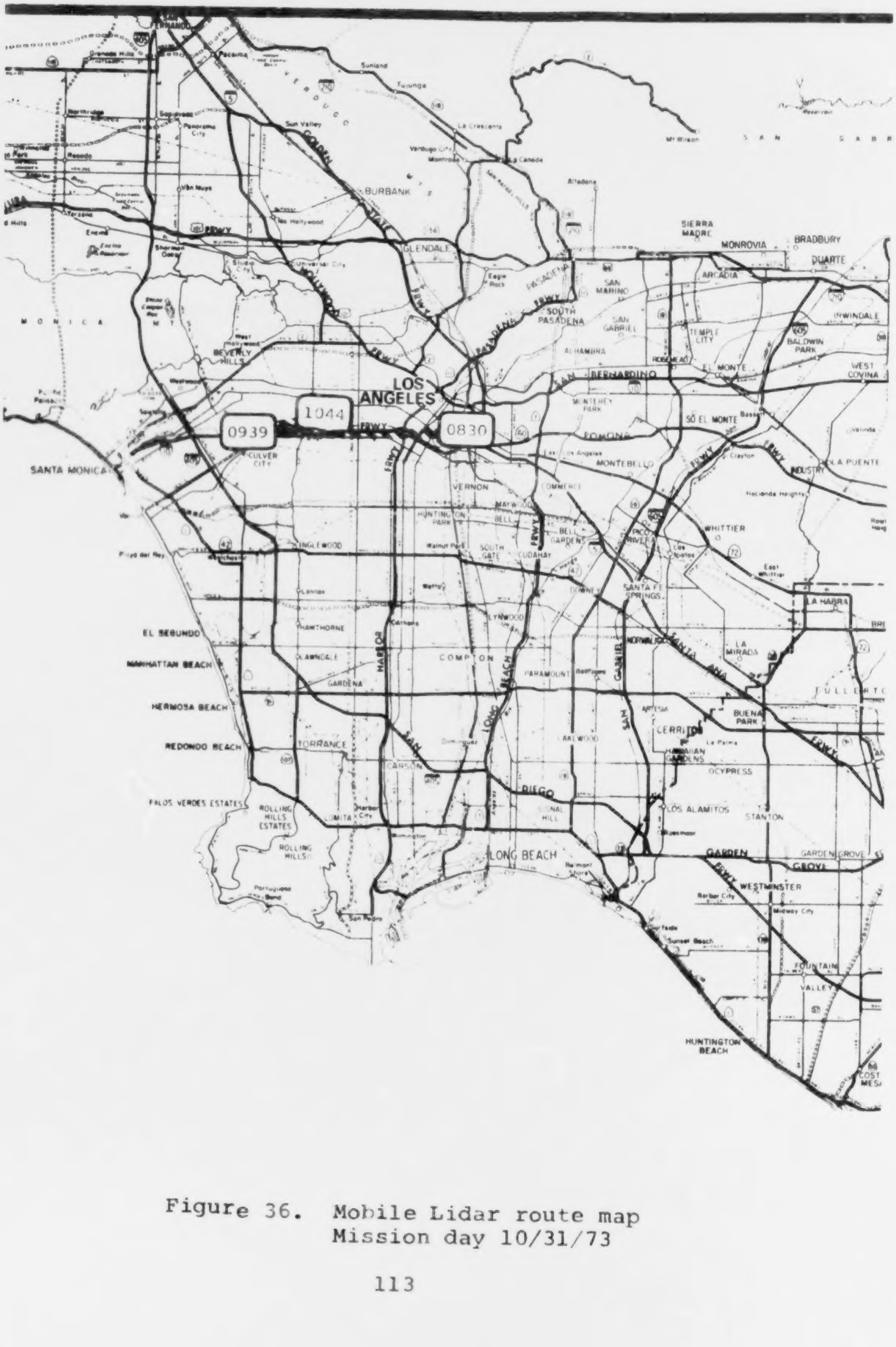

0939
1044
0830
LOS ANGELES
SANTA MONICA
CULVER CITY
BEVERLY HILLS
GLENDALE
BURBANK
PASADENA
LONG BEACH
COMPTON
TORRANCE
INGLEWOOD
WHITTIER
HUNTINGTON BEACH

Figure 36. Mobile Lidar route map
Mission day 10/31/73

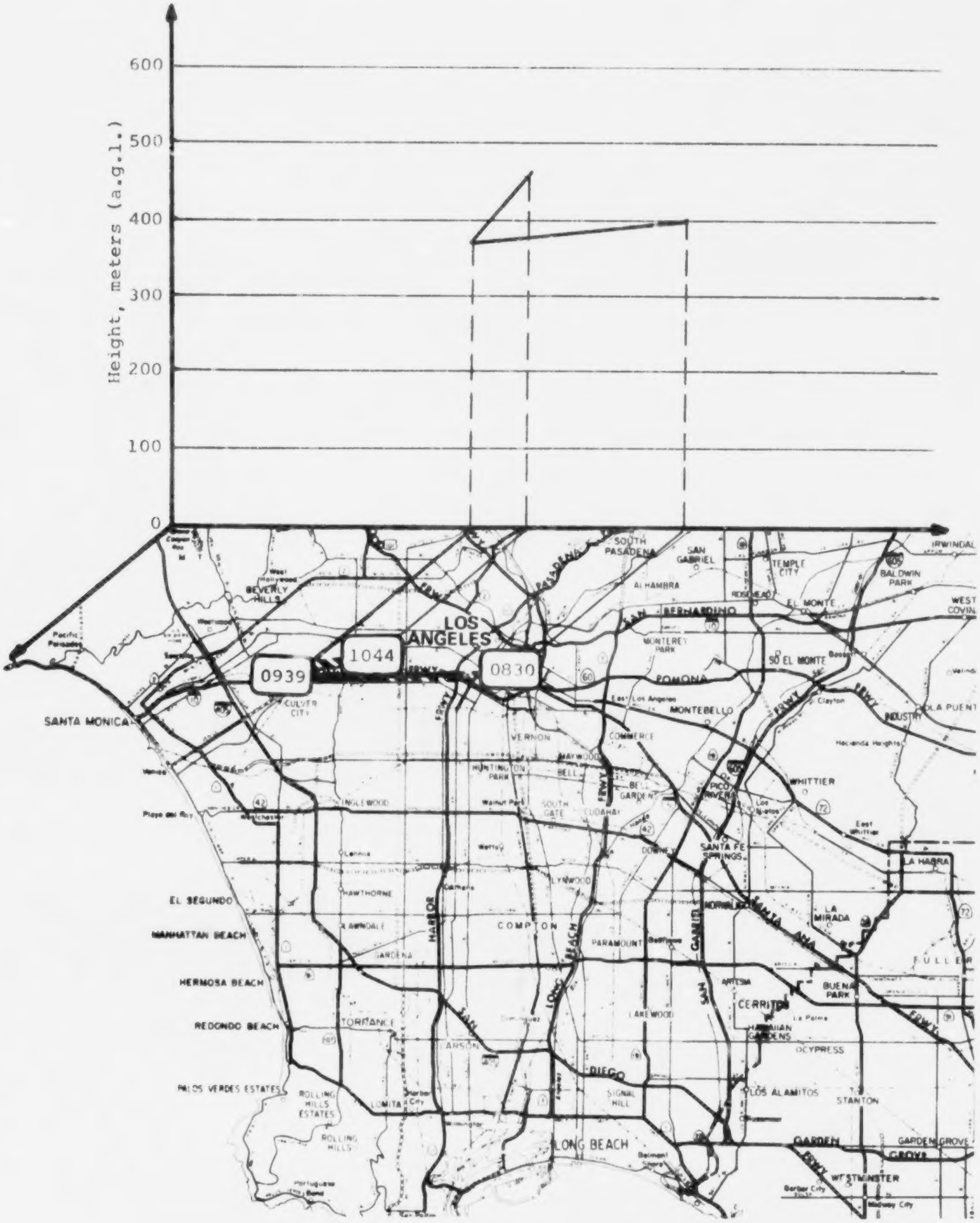


Figure 37. Mixing layer height along observational route
Mission day 10/31/73

MISSION DAY - 11/1/73

Weather conditions were fairly uniform throughout most of the Los Angeles basin for the entire day. The restrictions in visibility due to haze, and some early morning fog, did not clear in late afternoon. Partly cloudy skies kept ground temperatures in the mid 50's during the day.

The inversion base which existed at 0540 PST was well above the surface (446 meters) over LAX, but was reported on the surface near El Monte. The 1220 PST sounding at LAX showed the base had risen to 668 meters (a.g.l.), at which point the temperature increased 4°C over the next 774 meters.

Similar conditions prevailed over the central region near El Monte. The 1330 PST radiosonde record showed the inversion base at 740 meters (a.g.l.) with nearly isothermal conditions (± 1°C) up to an altitude of 1377 meters (a.g.l.). A similar lapse rate was measured at the 7th and Alameda launch site at 0530 PST. The weak temperature gradient conditions over both locations would offer only minimal trapping effects to surface generated effluents.

A predominant characteristic of the Lidar backscatter for that day was the minimum signal attenuation throughout the altitude range of 762 meters. No thermally created layering was at all detectable beneath 365 meters from 0730 until 1200 PST. Following that time, a recurring echo from about 46 meters (a.g.l.) signifies the existence of a thermal structure not indicated from radiosonde profiles.

Within the region from 640 to 732 meters (a.g.l.), light turbidity was found to occur on an intermittent basis. The temporal and spatial randomness of backscatter within this region is evident from the accompanying chart.

Chart 33. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 17 11/1/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600	510	610	510	610	446	668	357	446	3	Sfc	448	158	448	
0700									3					600-850
0800									2					600-750
0900									2					550-800
1000									3					650-750
1100									4					
1200					668	1442	668	818	5					
1300									7	740	920	408	740	
1400									8					
1500									8					
1600														

NOTE I_b Inversion base (meters)
I_t Inversion top (meters)
DP_b Lower altitude of gradient change in dewpoint (meters)
DP_t Upper altitude of gradient change in dewpoint (meters)
Vsb Visibility at the surface (miles)
MLH Mixing layer height (meters)

Chart 34. SUMMARY OF OPERATION

MISSION DAY 11/1/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	Y	
0530					Left Lidar Base
0625			24	59	Arrived @ Launch site "A" Downtown L.A.
0635	*		"	"	
0639	*		"	"	
0649		*	"	"	
0700	*		"	"	
0702	*		"	"	
0707	*		"	"	
0708	*		"	"	
0711	*		"	"	
0715	*		"	"	
0723	*		"	"	
0725	*		"	"	
0727	*		"	"	
0729	*		"	"	
0731	*		"	"	
0735	*		"	"	
0736		*	"	"	
0742			"	"	Launch
0759	*		16	60	Los Angeles
0801	*		"	"	
0803	*		"	"	
0806	*		"	"	
0809	*		"	"	
0812	*		"	"	
0815	*		"	"	
0817	*		"	"	
0820	*		"	"	
0821		*	"	"	
0824	*		"	"	
0826	*		"	"	
0828	*		"	"	
0829	*		"	"	
0830		*	"	"	
0900	*		9	56	Culver City
0903	*		"	"	
0910	*		"	"	
0914	*		"	"	
0918	*		"	"	
0919		*	"	"	
0921	*		"	"	

Chart 34 (continued). SUMMARY OF OPERATION

MISSION DAY 11/1/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	X	REMARKS
0925	*		9	56	
0930	*		"	"	
0934	*		"	"	
0937	*		"	"	
0943	*		"	"	
0944		*	"	"	
1013	*		3	60	West Los Angeles
1018	*		"	"	
1022		*	"	"	
1145			24	59	Second Launch
1406					Boresighting and alignment checked out
1645					Arrived @ Lidar Base

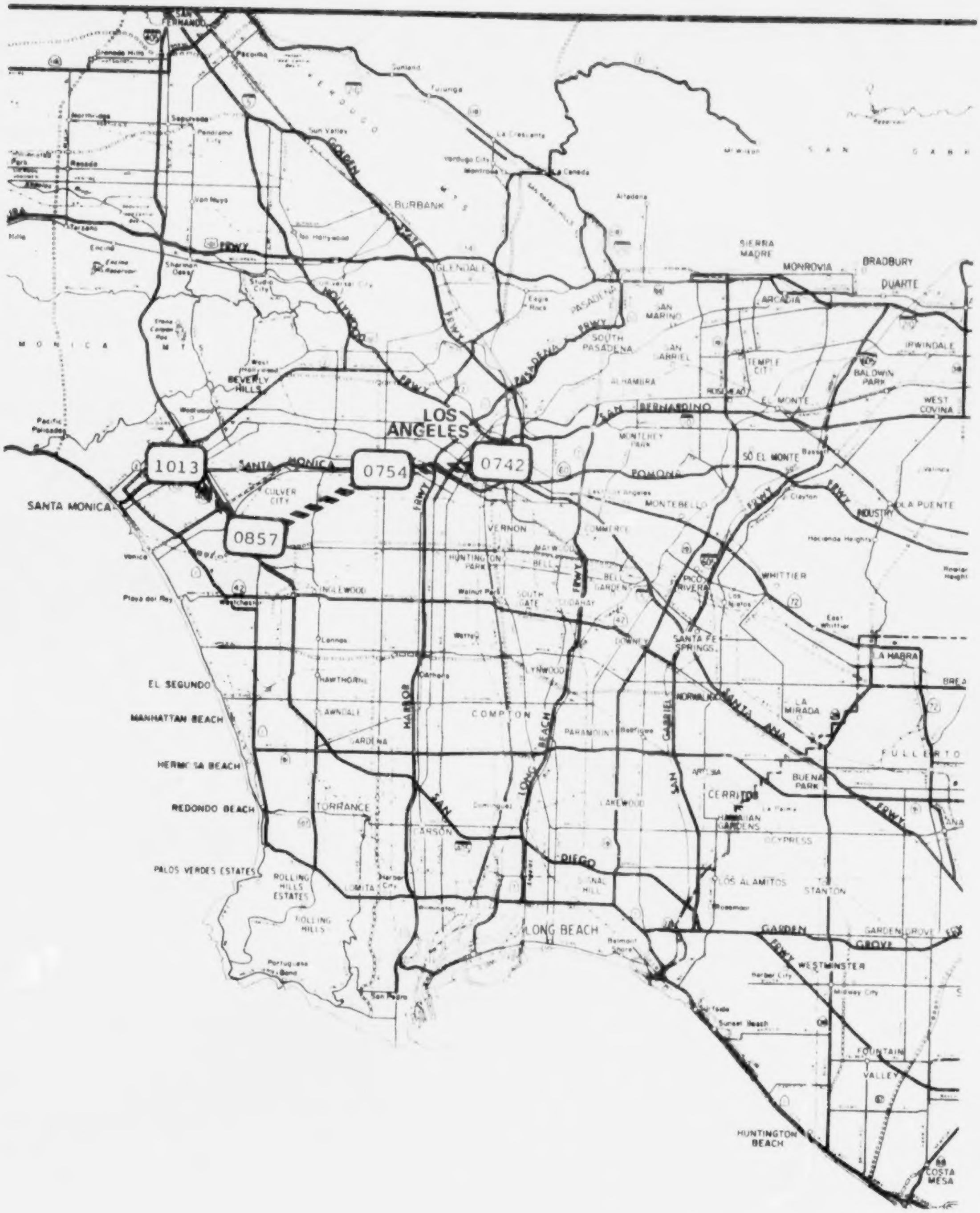

1013
0754
0742
0857
LOS ANGELES
SANTA MONICA
SANTA MONICA
CULVER CITY
BEVERLY HILLS
BURBANK
GLENDALE
PASADENA
SOUTH PASADENA
SAN MARINO
SAN GABRIEL
ALHAMBRA
TEMPLE CITY
ARCADIA
MONROVIA
BRADBURY
DUARTE
SIERRA MADRE
IRWINDALE
BALDWIN PARK
EL MONTE
SO. EL MONTE
WEST COVINA
LA PUENTE
MONTEREY PARK
MONTEBELLO
COMMERCE
VERNON
HUNTINGTON PARK
SOUTH GATE
PICO RIVERA
WHITTIER
SANTA FE SPRINGS
LA HABRA
LA MIRADA
FULLERTO
BUENA PARK
CERRITOS
NORWALK
DOWNEY
LYNWOOD
COMPTON
PARAMOUNT
LAKEWOOD
INGLEWOOD
HAWTHORNE
LAWNDALE
GARDENA
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
TORRANCE
CARSON
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
ROLLING HILLS
LOMITA
SIGNAL HILL
LONG BEACH
LOS ALAMITOS
CYPRESS
STANTON
GARDEN GROVE
WESTMINSTER
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA
SAN BERNARDINO
POMONA
HARBOR
LONG BEACH
SAN GABRIEL
SAN DIEGO
SANTA ANA
HOLLYWOOD
GOLDEN STATE
FRWY

Figure 38. Mobile Lidar route map
Mission day 11/1/73

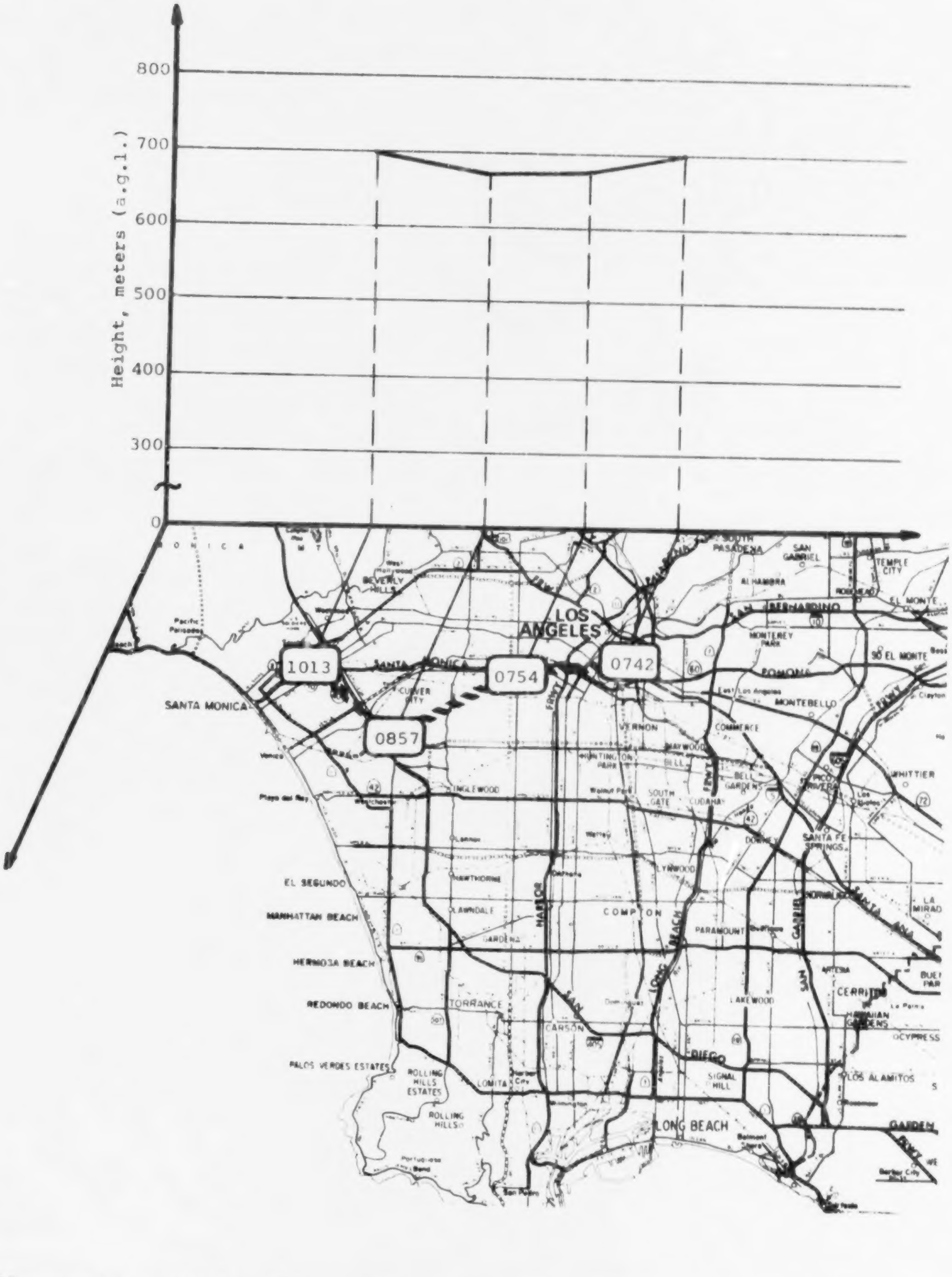


Figure 39. Mixing layer height along observational route Mission day 11/1/73

MISSION DAY - 11/2/73

Cloudy conditions prevailed over most of the Southern California regions for the entire day. The ground level temperature did not vary by more than 8 degrees over the 24 hours, generally staying below 67 degrees. Radiosonde releases at LAX and El Monte showed no traces of a temperature inversion, however a minor one was reported at 1550 meters in the 0825 Downey launch data. The existence of cloudy conditions was revealed by the moisture level increases above 300 meters.

An electronic failure in the recording system prevented the recovery of a significant portion of Lidar data for 2 November. The mixing level heights were taken from the Polaroid prints of the unprocessed signal returns used as a backup for the day's operation.

Indicated in each Lidar return from that day was the predominately high scattering intensity from a stratus deck at about 700-800 meters. The layer was at times as much as 400 meters thick but contained numerous breaks. The upper level stratus top was placed at above 1300 meters with some degree of uncertainty here due to the significant beam attenuation encountered, and height variations of the lower boundary.

Chart 35. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 18 11/2/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600	1400	1550	1400	1550	none		373	500	10	none		none		
0700									12					
0800									12					
0900									12					
1000									12					700-1300
1100									12					
1200					none		616	1000	12					875-1400
1300									12	none		none		960-1100
1400									15					1075-1290
1500									15					
1600														

NOTE I_b Inversion base (meters)

I_t Inversion top (meters)

DP_b Lower altitude of gradient change in dewpoint (meters)

DP_t Upper altitude of gradient change in dewpoint (meters)

Vsb Visibility at the surface (miles)

MLH Mixing layer height (meters)

Chart 36. SUMMARY OF OPERATION

MISSION DAY 11/2/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	L.A. BASIN GRID POSITION COORDINATES Y	REMARKS
0830					Left Lidar Base
0925			31	47	Arrived @ Launch site "J" Downey
1015	*		"	"	
1020	*		"	"	
1027	*		"	"	
1036	*		"	"	
1151			"	"	Launch
1236	*		24	61	Los Angeles
1240	*		"	"	
1245	*		"	"	
1340	*		30	73	Pasadena
1351	*		"	"	
1408	*		"	"	
1412	*		"	"	
1745					Arrived @ Lidar Base

Due to electronic malfunction, the digitized data was lost. Polaroid photos were taken at time and position indicated above.

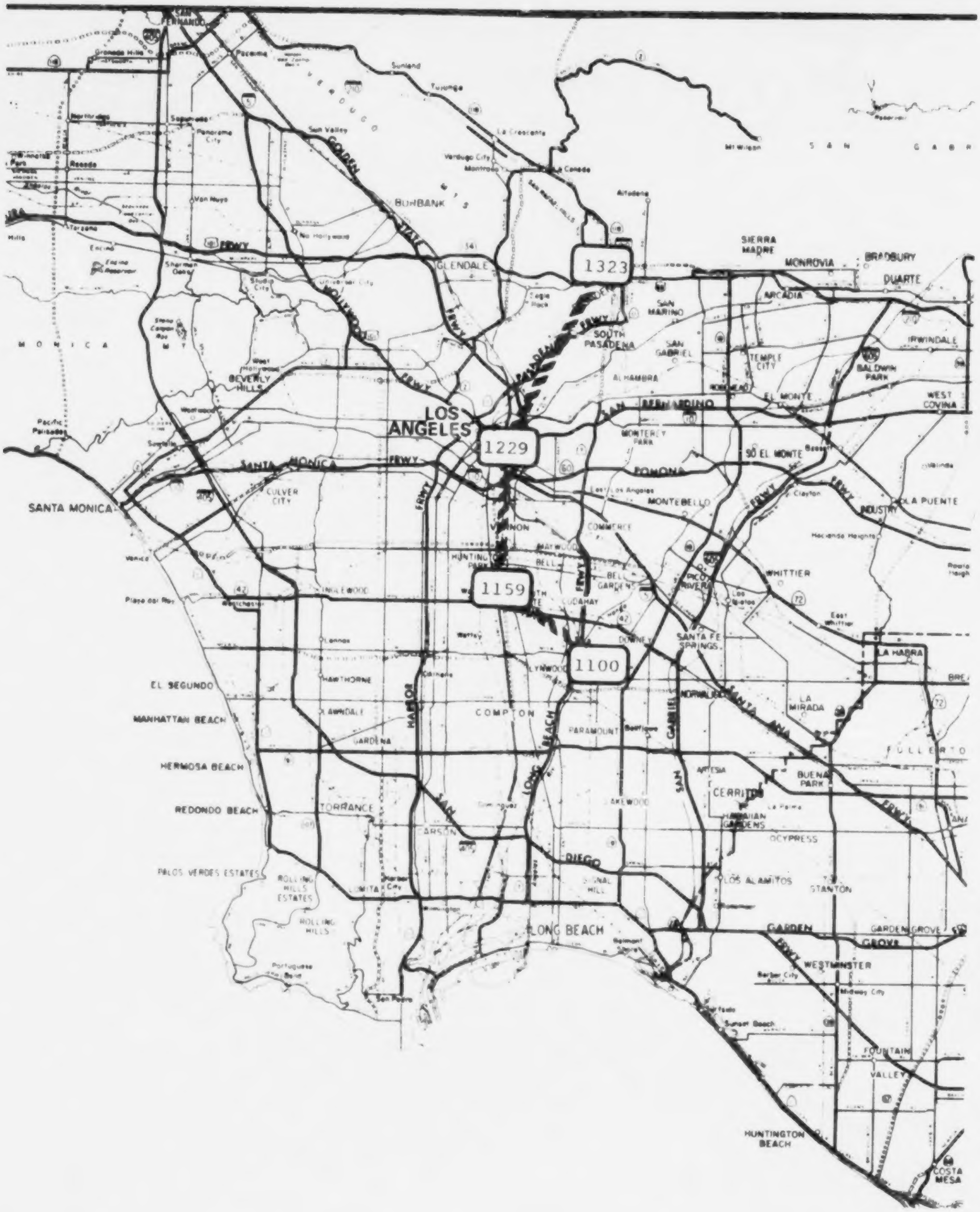

1323
1229
1159
1100
SAN FERNANDO
Sunland
Tujunga
Pacoima
Panorama City
Sun Valley
La Crescenta
La Canada
Verdugo City
Montrose
Altadena
Mt Wilson
SAN GABR
BURBANK
Van Nuys
Tarzana
Encino
Sherman Oaks
Studio City
GLENDALE
Eagle Rock
SIERRA MADRE
MONROVIA
BRADBURY
DUARTE
ARCADIA
SAN MARINO
SOUTH PASADENA
SAN GABRIEL
TEMPLE CITY
IRWINDALE
BALDWIN PARK
ALHAMBRA
ROSEMEAD
EL MONTE
WEST COVINA
MONICA
BEVERLY HILLS
West Hollywood
LOS ANGELES
SAN BERNARDINO
MONTEREY PARK
SO EL MONTE
Pacific Palisades
Westwood
SANTA MONICA
SANTA MONICA FRWY
CULVER CITY
POMONA
MONTEBELLO
East Los Angeles
LA PUENTE
INDUSTRY
Clayton
Hacienda Heights
VERNON
COMMERCE
HUNTINGTON PARK
BELL
BELL GARDENS
PICO RIVERA
WHITTIER
Venice
Playa del Rey
Westchester
INGLEWOOD
CUDAHY
SANTA FE SPRINGS
East Whittier
LA HABRA
Lennox
HAWTHORNE
LYNWOOD
DOWNEY
EL SEGUNDO
MANHATTAN BEACH
LAWNDALE
COMPTON
PARAMOUNT
Bellflower
NORWALK
LA MIRADA
FULLERTON
GARDENA
HARBOR
LONG BEACH
SAN GABRIEL
SANTA ANA FRWY
HERMOSA BEACH
ARTESIA
BUENA PARK
REDONDO BEACH
TORRANCE
LAKEWOOD
CERRITOS
HAWAIIAN GARDENS
La Palma
CARSON
SAN DIEGO
CYPRESS
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
ROLLING HILLS
LOMITA
SIGNAL HILL
LOS ALAMITOS
STANTON
Wilmington
LONG BEACH
GARDEN GROVE
Portuguese Bend
San Pedro
Belmont Shore
WESTMINSTER
Seal Beach
Sunset Beach
Midway City
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA

Figure 40. Mobile Lidar route map
Mission day 11/2/73

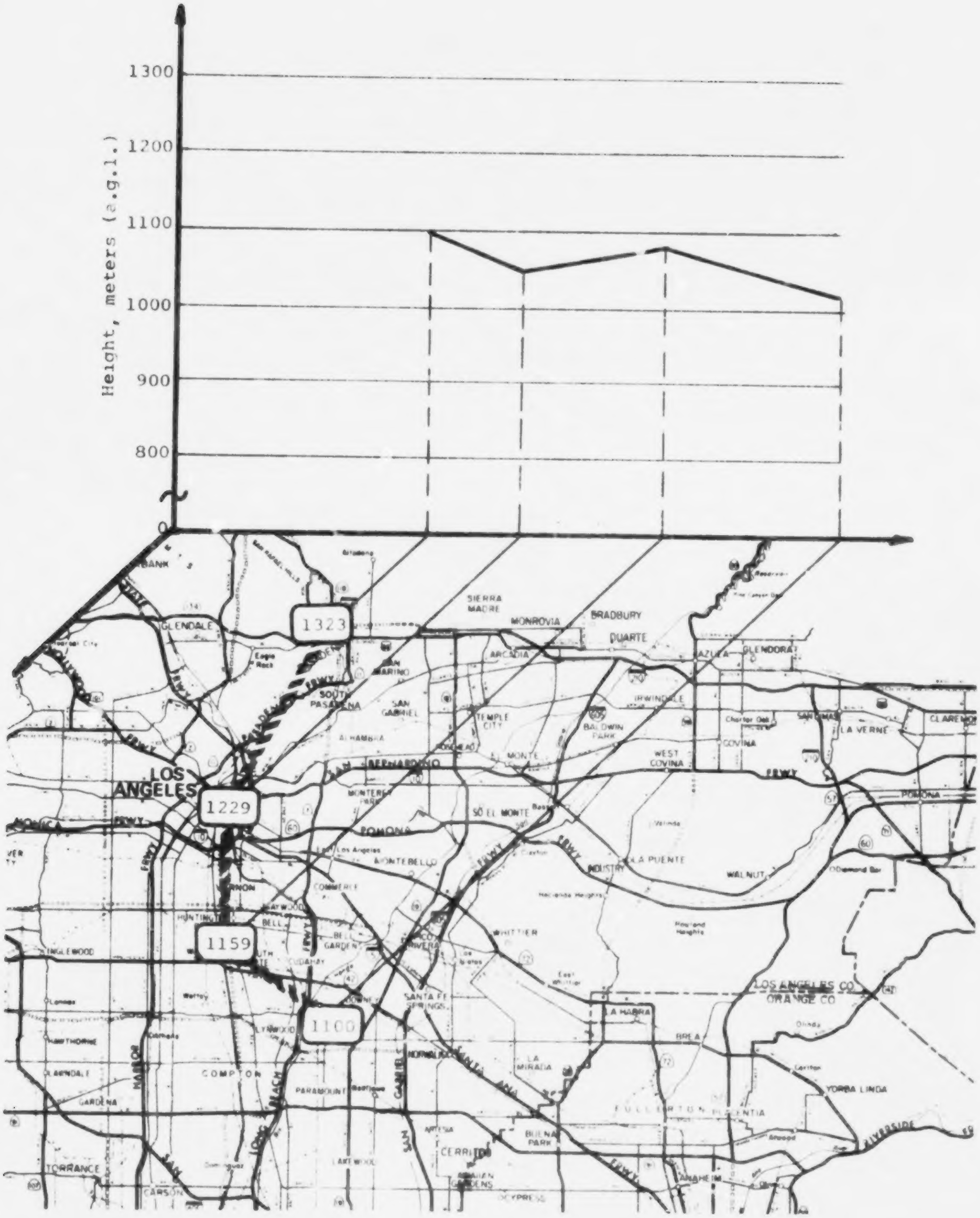


Figure 41. Mixing layer height along observational route Mission day 11/2/73

MISSION DAY - 11/5/73

An early morning light haze near the coast was the only visibility limiting feature for the day, with visibilities of near 10 miles inland. Warmer conditions inland, in the low 70's, along with a ground-based inversion produced a partial trapping condition for that morning. The radiosonde profile for the 0525 PST Downey site and the 0530 PST LAX site both indicated the surface inversion and a second temperature inversion gradient of 0.5°C at approximately 778 meters. By early afternoon, surface heating had substantially removed all traces of the earlier inversion.

Lidar returns for most of the morning indicated the existence of a low level (60-80 meter) layer, possibly due to the reported inversion. Numerous layers and scattering irregularity also existed. A transition from the turbid region into a cleaner air was manifested by the usual scatter intensity drop-off at just above 450-465 meters. A check of the radiosonde humidity profiles for that morning showed only a slight decrease in moisture content beginning at 400 meters. The heights of measured signal returns appeared rather uniform considering the large spatial separation or distance traveled by the Lidar van for that day.

Temperature profiles obtained by helicopter all terminated at too low an elevation, about 300 meters, to be useful to the analysis on that day which had the top of the aerosol layer predominantly above 400 meters and much of the time a great deal higher. The only exception was the special vertical pattern flown by the helicopter at 1340 PST. This revealed a weak inversion layer between 375 and 450 meters at the same time that the Lidar reported tops of the aerosol layer ranging between 360 and 400 meters.

Chart 37. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 19 11/5/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600	Sfc	400	80	400	Sfc	266	none		10	Sfc	628	207	300	
0700									10					
0800									10					
0900									5					700-900
1000									5					600-800
1100									10					490-740
1200					none		none		8					400-600
1300									8	none		none		350-550
1400									14					250-500
1500									20					350-450
1600														

NOTE I_b Inversion base (meters)
I_t Inversion top (meters)
DP_b Lower altitude of gradient change in dewpoint (meters)
DP_t Upper altitude of gradient change in dewpoint (meters)
Vsb Visibility at the surface (miles)
MLH Mixing layer height (meters)

Chart 38. SUMMARY OF OPERATION

MISSION DAY 11/5/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	Y	REMARKS
0515					Left Lidar Base
0659			31	47	Arrived @ Launch site "J" Downey
0715			"	"	Launch
0806	*		27	40	North Long Beach
0808	*		"	"	
0809		*	"	"	
0822	*		21	46	Compton
0832	*		"	"	
0835	*		"	"	
0837	*		"	"	
0840	*		"	"	
0843	*		"	"	
0845	*		"	"	
0848	*		"	"	
0850	*		"	"	
0851		*	"	"	
0933	*		31	42	Paramount
0937	*		"	"	
0941	*		"	"	
0942		*	"	"	
0944	*		"	"	
0946	*		"	"	
0948	*		"	"	
0950	*		"	"	
0952	*		"	"	
0955	*		"	"	
0956		*	"	"	
1006	*		"	"	
1008	*		"	"	
1010	*		"	"	
1011		*	"	"	
1014	*		"	"	
1016	*		"	"	
1018	*		"	"	
1020	*		"	"	
1022	*		"	"	
1024	*		"	"	
1025		*	"	"	
1047	*		39	41	Artesia
1050	*		"	"	
1053	*		"	"	
1054		*	"	"	

Chart 38 (continued). SUMMARY OF OPERATION

MISSION DAY 11/5/73

	LIDAR		L.A. BASIN GRID POSITION COORDINATES		
TIME	ON	OFF	X	X	REMARKS
1057	*		39	41	
1100	*		"	"	
1103	*		"	"	
1105	*		"	"	
1106	*		"	"	
1108	*		"	"	
1110	*		"	"	
1111		*	"	"	
1128	*		42	44	Norwalk
1131	*		"	"	
1134	*		"	"	
1135		*	"	"	
1137	*		"	"	
1140	*		"	"	
1142	*		"	"	
1143	*		"	"	
1145	*		"	"	
1148	*		"	"	
1150	*		"	"	
1152	*		"	"	
1154	*		"	"	
1155		*	"	"	
1210	*		44	45	La Mirada
1214	*		"	"	
1218		*	"	"	
1222	*		"	"	
1226	*		"	"	
1234	*		"	"	
1237	*		"	"	
1240	*		"	"	
1241		*	"	"	
1254	*		46	49	E. Whittier
1258	*		"	"	
1305	*		"	"	
1307	*		"	"	
1310	*		"	"	
1311		*	"	"	
1313	*		"	"	
1315	*		"	"	
1317		*	"	"	
1350	*		50	56	Hacienda Heights

Chart 38 (continued). SUMMARY OF OPERATION

MISSION DAY 11/5/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	X	
1352	*		50	56	
1355	*		"	"	
1356	*		"	"	
1358	*		"	"	
1359	*		"	"	
1400	*		"	"	
1401	*		"	"	
1404	*		"	"	
1405	*		"	"	
1406		*	"	"	
1429	*		58	58	Walnut
1430	*		"	"	
1433	*		"	"	
1436	*		"	"	
1437	*		"	"	
1439	*		"	"	
1440		*	"	"	
1715					Arrived @ Lidar Base

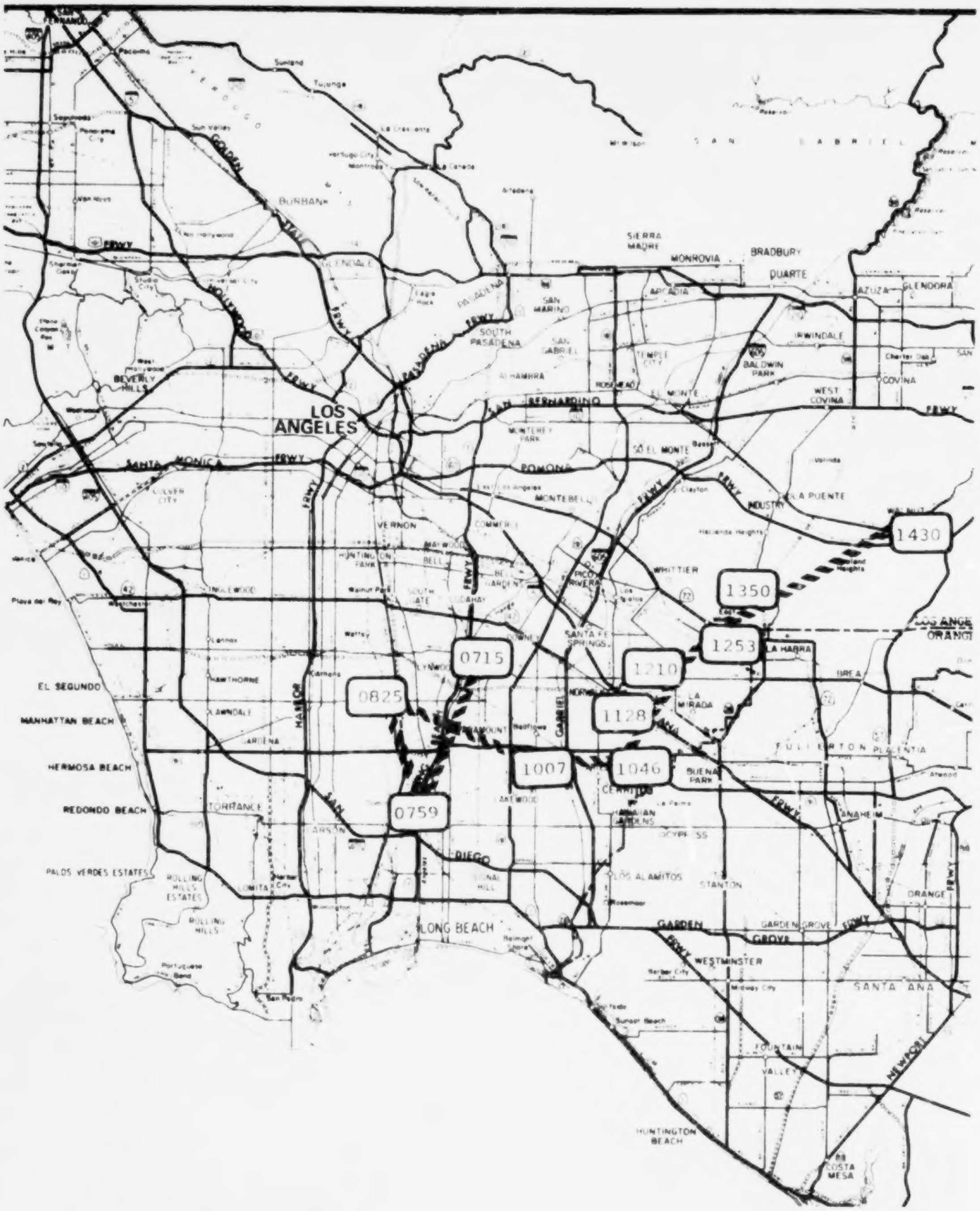

0715
0825
0759
1007
1046
1128
1210
1253
1350
1430
LOS ANGELES
LONG BEACH
SANTA ANA
HUNTINGTON BEACH
COSTA MESA
WHITTIER
LA HABRA
FULLERTON
ANAHEIM
BURBANK
GLENDALE
PASADENA
SANTA MONICA FRWY
SAN BERNARDINO
POMONA
TORRANCE
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
INGLEWOOD
DOWNEY
LAKEWOOD
GARDEN GROVE
WESTMINSTER
ORANGE

Figure 42. Mobile Lidar route map
Mission day 11/5/73

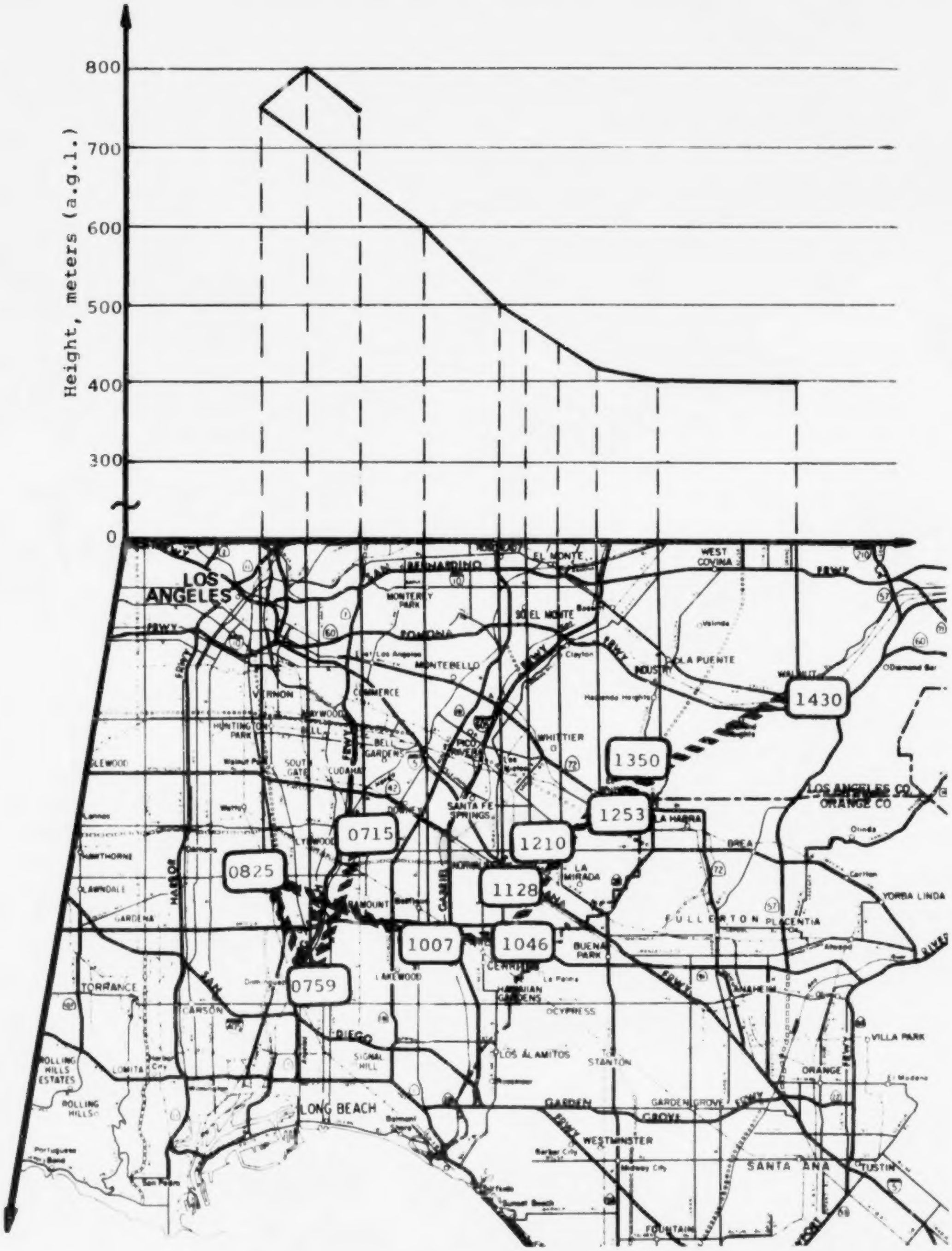


Figure 43. Mixing layer height along observational route
Mission day 11/5/73

MISSION DAY - 11/6/73

The meteorological conditions for the 6th were similar to those of the previous day. A similar but perhaps stronger inversion existed near ground level with a top of around 1068 meters at LAX during the morning. A complex multiple temperature gradient was revealed in the LAX and El Monte radiosonde profiles. Using the 1130 PST radiosonde observation from LAX as reference, the secondary temperature base was located between 366 meters and 537 meters with a top of about 796 meters. Later profiles showed the surface based inversion had disappeared, but some trapping still existed because the unique temperature structure persisted above 300 meters.

Lidar returns for the period between 0640 and 0800 PST revealed the presence of a significant layer at 240 meters (a.g.l.). Although an inversion gradient of 2.0°C was indicated on the 0628 PST LAX profile, an increase in dewpoint temperature also appeared at this corresponding altitude. The lower level appeared to shift downward with time in the Lidar photos, and disappeared at around 1000 PST. Beam penetration into the cleaner air was again manifested by the signal falloff above 650 meters (a.g.l.). The region between 650 and 800 meters represents several temperature gradients of about 1.3°C, as reported on the 1130 radiosonde.

Chart 39. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 20 11/6/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600	Sfc	740	none		Sfc	141/1068	141	266	14	Sfc	929	none		700-900
0700									10					400-475
0800									8					375-650
0900									8					375-575
1000									6					250-750
1100									6					600-750
1200					366	537/796	257	366	6					600-700
1300									10	707	1152	none		525-650
1400									10					
1500									14					
1600														

NOTE I_b Inversion base (meters)

I_t Inversion top (meters)

DP_b Lower altitude of gradient change in dewpoint (meters)

DP_t Upper altitude of gradient change in dewpoint (meters)

Vsb Visibility at the surface (miles)

MLH Mixing layer height (meters)

Chart 40. SUMMARY OF OPERATION

MISSION DAY 11/6/73

TIME	LIDAR		L.A. BASIN GRID POSITION COORDINATES		REMARKS
	ON	OFF	X	Y	
0530					Left Lidar Base
0630			24	60	Arrived @ Launch site "A" Downtown L.A.
0632	*		"	"	
0637	*		"	"	
0640	*		"	"	
0641	*		"	"	
0642		*	"	"	
0644	*		"	"	
0645	*		"	"	
0646		*	"	"	
0648	*		"	"	
0656	*		"	"	
0704	*		"	"	
0705	*		"	"	
0706		*	"	"	
0710	*		"	"	
0721	*		"	"	
0723	*		"	"	
0724		*	"	"	
0729	*		"	"	
0733	*		"	"	
0740	*		"	"	
0741	*		"	"	
0742		*	"	"	
0806	*		19	53	Los Angeles
0808	*		"	"	
0812	*		"	"	
0814	*		"	"	
0819	*		"	"	
0821		*	"	"	
0822	*		"	"	
0824	*		"	"	
0827	*		"	"	
0829	*		"	"	
0831	*		"	"	
0833	*		"	"	
0834		*	"	"	
0836	*		"	"	
0837		*	"	"	

Chart 40 (continued). SUMMARY OF OPERATION

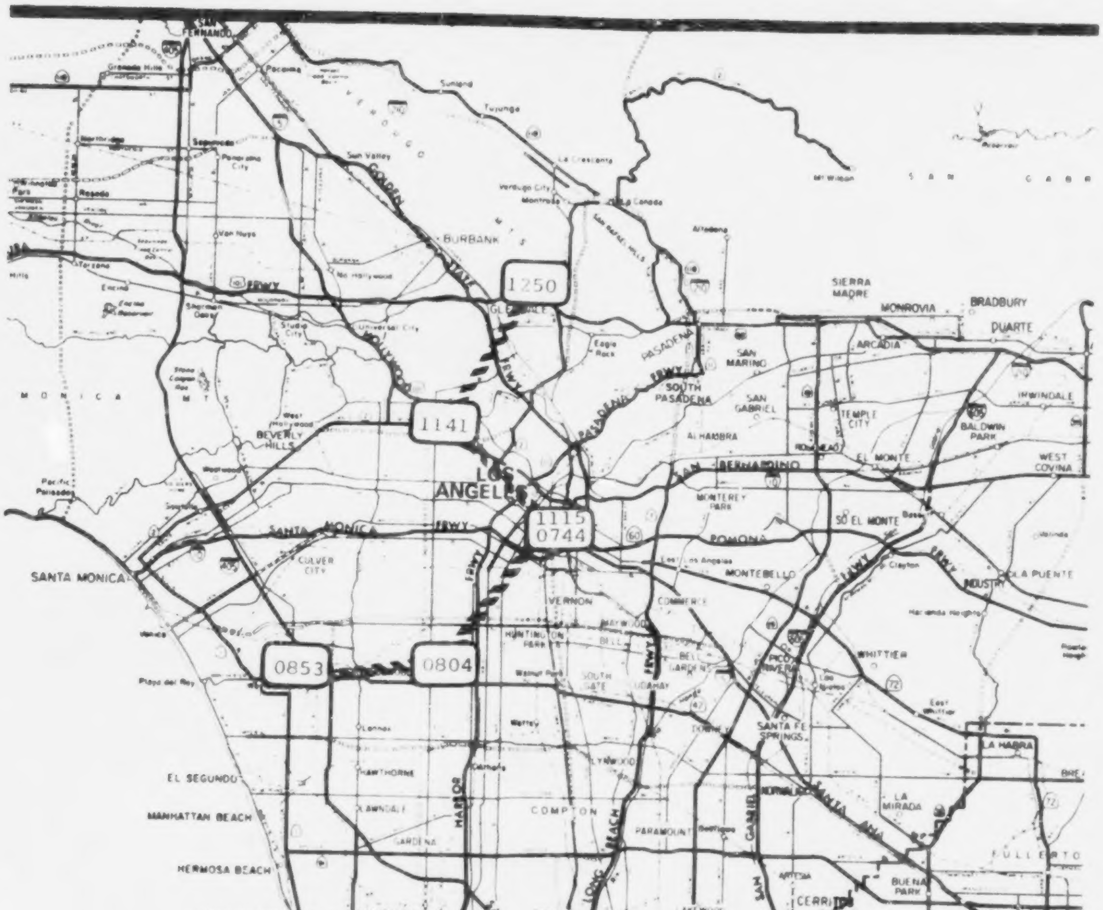
MISSION DAY 11/6/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	X	REMARKS
0858	*		11	51	Inglewood
0900	*		"	"	
0905	*		"	"	
0907	*		"	"	
0909	*		"	"	
0914	*		"	"	
0915		*	"	"	
0917	*		"	"	
0920	*		"	"	
0922	*		"	"	
0923		*	"	"	
0950			24	60	Return to Launch site "A" for new launch.
0958	*		"	"	
1001	*		"	"	
1003	*		"	"	
1007	*		"	"	
1011	*		"	"	
1012	*		"	"	
1016	*		"	"	
1017	*		"	"	
1018		*	"	"	
1023	*		"	"	
1026	*		"	"	
1030	*		"	"	
1031		*	"	"	
1037	*		"	"	
1041	*		"	"	
1045	*		"	"	
1049	*		"	"	
1050	*		"	"	
1051		*	"	"	
1105			"	"	Launch
1115					Left Launch site
1144	*		18	65	Hollywood
1154	*		"	"	
1157	*		"	"	
1200	*		"	"	
1202	*		"	"	
1203		*	"	"	
1206	*		"	"	

Chart 40 (continued). SUMMARY OF OPERATION

MISSION DAY 11/6/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	X	REMARKS
1208	*		18	65	
1210	*		"	"	
1211		*	"	"	
1250	*		22	74	Glendale
1252	*		"	"	
1255	*		"	"	
1257	*		"	"	
1300	*		"	"	
1304	*		"	"	
1305		*	"	"	
1307	*		"	"	
1310	*		"	"	
1312	*		"	"	
1313	*		"	"	
1314		*	"	"	
1318	*		"	"	
1320	*		"	"	
1322	*		"	"	
1323		*	"	"	Mission completed
1530					Arrived @ Lidar Base


1250
1141
1115
0744
0853
0804
SAN FERNANDO
BURBANK
GLENDALE
PASADENA
SOUTH PASADENA
SAN MARINO
SAN GABRIEL
ALHAMBRA
SIERRA MADRE
MONROVIA
BRADBURY
ARCADIA
DUARTE
TEMPLE CITY
IRWINDALE
BALDWIN PARK
EL MONTE
WEST COVINA
BEVERLY HILLS
LOS ANGELES
SANTA MONICA
CULVER CITY
MONTEREY PARK
SO EL MONTE
MONTEBELLO
LA PUENTE
INDUSTRY
VERNON
COMMERCE
HUNTINGTON PARK
BELL
BELL GARDENS
PICO RIVERA
WHITTIER
SOUTH GATE
LYNWOOD
DOWNEY
SANTA FE SPRINGS
LA HABRA
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
HAWTHORNE
LAWNDALE
GARDENA
COMPTON
PARAMOUNT
NORWALK
LA MIRADA
FULLERTON
BUENA PARK
CERRITOS
HAWAIIAN GARDENS
CYPRESS
LAKEWOOD
TORRANCE
CARSON
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
ROLLING HILLS
SIGNAL HILL
LOS ALAMITOS
STANTON
LONG BEACH
GARDEN GROVE
WESTMINSTER
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA
SANTA MONICA FRWY
SAN BERNARDINO
POMONA
HARBOR
LONG BEACH
SAN GABRIEL
SAN DIEGO
SANTA ANA FRWY
GARDEN GROVE FRWY
GOLDEN STATE FRWY
VENTURA FRWY
PASADENA FRWY
M O N I C A   M T S
S A N   G A B R

1st launch - 0744 - 0853
2nd launch - 1115 - 1250

Figure 44. Mobile Lidar route map
Mission day 11/6/73

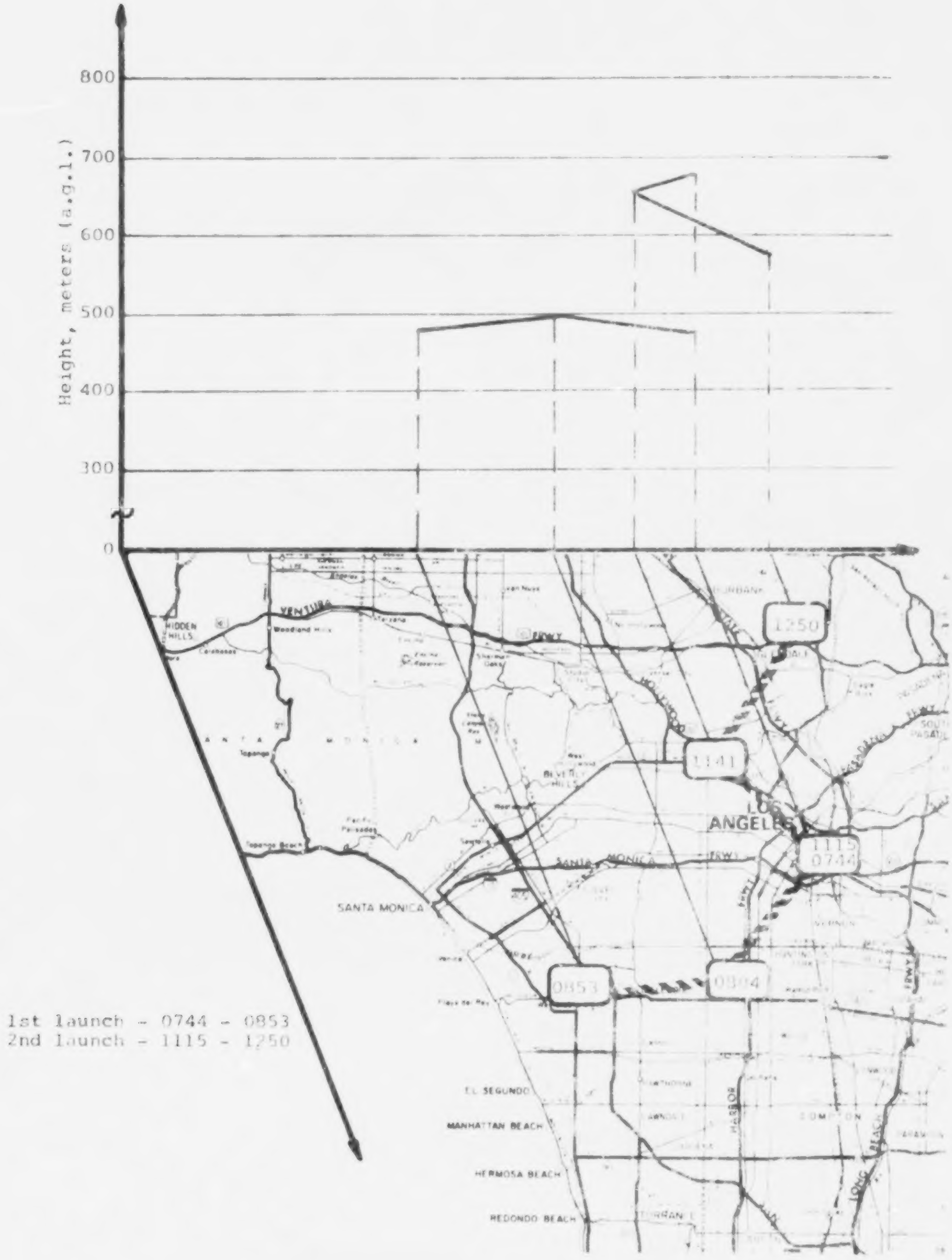


Figure 45. Mixing layer height along observational route
Mission day 11/6/73

MISSION DAY - 11/7/73

Conditions were again very uniform over most of Southern California, with only light to moderate early morning haze and fog reported along the coast. A ground-based temperature inversion existed during early morning with a top of around 586 meters. The top effectively moved up to 1067 meters during the day. By noon, surface heating had removed the lower inversion but a secondary inversion with a temperature gradient of 1.6°C still existed between 616 and 1067 meters (a.g.l.).

The early morning Lidar returns revealed boundary layer penetration between 400 and 600 meters where the only significant feature seemed to be the upper level temperature inversion top near 680 meters. The region between 400 and 600 meters exhibited less attenuation per unit path length as compared to the atmosphere below 400 meters. The lower level inversion base, or remnants thereof, continued to be detected for most of the day. However, what appeared to be a low level inversion indication, may have been the result of multiple vertically stacked layers, each having a successively lower attenuation coefficient than the one below. At the uppermost level, 640 meters, no corresponding gradient in temperature or humidity could be found that would correlate or explain the Lidar signatures.

Chart 41. COMPARISON OF LIDAR MIXING LAYER HEIGHT WITH METEOROLOGICAL OBSERVATIONS

RUN 21 11/7/73

TIME	LAUNCH SITE				LAX					EL MONTE				LIDAR
	I_b	I_t	DP_b	DP_t	I_b	I_t	DP_b	DP_t	Sfc Vsb	I_b	I_t	DP_b	DP_t	MLH
0600	Sfc	400	none		Sfc	586	348	586	N.A.	Sfc	999	429	667	
0700														
0800														400-585
0900														400-550
1000														560
1100														350-450
1200					135	1067	none							475-575
1300										524	890	524	890	450-600
1400														375-500
1500														
1600														

NOTE I_b Inversion base (meters)
I_t Inversion top (meters)
DP_b Lower altitude of gradient change in dewpoint (meters)
DP_t Upper altitude of gradient change in dewpoint (meters)
Vsb Visibility at the surface (miles)
MLH Mixing layer height (meters)

Chart 42. SUMMARY OF OPERATION

MISSION DAY 11/7/73

TIME	LIDAR	LIDAR	L.A. BASIN GRID POSITION COORDINATES	L.A. BASIN GRID POSITION COORDINATES	REMARKS
	ON	OFF	X	Y	
0630					Left Lidar Base
0749					Arrived @ launch site "A" Downtown L.A.
0805	*		24	59	
0807	*		"	"	
0808	*		"	"	
0813	*		"	"	
0820	*		"	"	
0821	*		"	"	
0827	*		"	"	
0833	*		"	"	
0834	*		"	"	
0836		*	"	"	
0903	*		18	63	Los Angeles
0905	*		"	"	
0910	*		"	"	
0925	*		"	"	
0931		*	"	"	
0937	*		15	63	Los Angeles
0940	*		"	"	
0944	*		"	"	
0948	*		"	"	
0950	*		"	"	
0951		*	"	"	
0954	*		"	"	
0956	*		"	"	
0957	*		"	"	
0958		*	"	"	
1004	*		"	"	
1006	*		"	"	
1007		*	"	"	
1024	*		14	65	Hollywood
1025		*	"	"	
1027	*		"	"	
1028		*	"	"	
1031	*		"	"	
1033	*		"	"	
1034		*	"	"	
1040	*		"	"	
1042	*		"	"	
1043		*	"	"	

Chart 42 (continued). SUMMARY OF OPERATION

MISSION DAY 11/7/73

TIME	LIDAR ON	LIDAR OFF	L.A. BASIN GRID POSITION COORDINATES X	X	REMARKS
1130	*		12	72	Universal City
1135	*		"	"	
1135	*		"	"	
1139	*		"	"	
1147	*		"	"	
1150	*		"	"	
1151	*		"	"	
1203	*		"	"	
1204	*		"	"	
1206		*	"	"	
1315	*		33	63	Observations taken along San Bernardino Fwy. near Garvey - East to Covina and return.
1318	*		"	"	
1323	*		"	"	
1328	*		"	"	
1333	*		"	"	
1335	*		"	"	
1339	*		"	"	
1341	*		"	"	
1345	*		"	"	
1347	*		"	"	
1348	*		"	"	
1351	*		"	"	
1352	*		"	"	
1356	*		"	"	
1358	*		"	"	
1400	*		"	"	
1403	*		"	"	
1404	*		"	"	
1406	*		"	"	
1410	*		"	"	
1412	*		"	"	
1413	*		"	"	
1415	*		"	"	
1417		*	"	"	
1530					Arrived @ Lidar Base

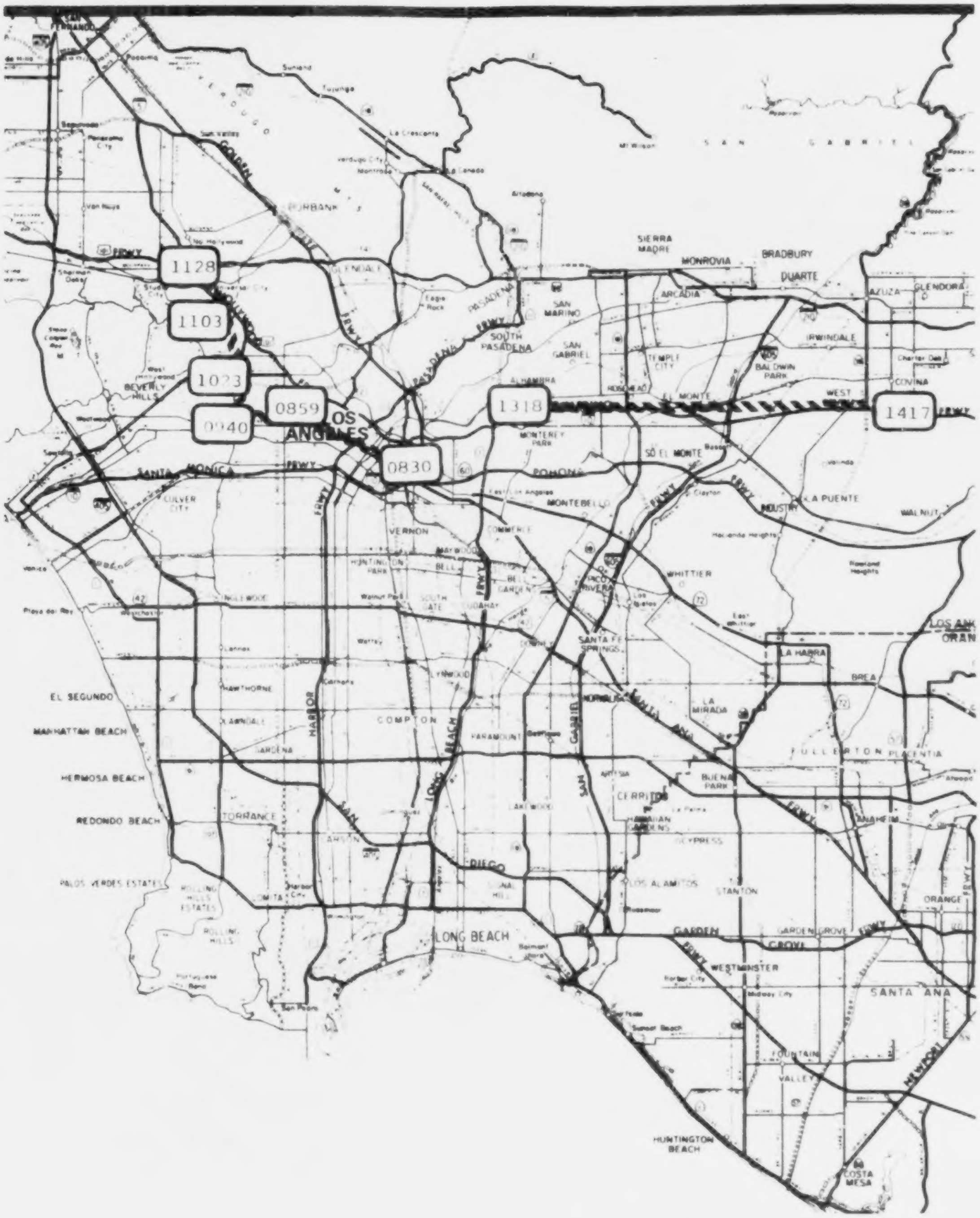

1128
1103
1023
0940
0859
0830
1318
1417
SAN FERNANDO
BURBANK
GLENDALE
PASADENA
SIERRA MADRE
MONROVIA
BRADBURY
DUARTE
AZUSA
GLENDORA
ARCADIA
SAN MARINO
SOUTH PASADENA
SAN GABRIEL
TEMPLE CITY
BALDWIN PARK
IRWINDALE
COVINA
WEST
ALHAMBRA
BEVERLY HILLS
LOS ANGELES
MONTEREY PARK
SO EL MONTE
SANTA MONICA FRWY
CULVER CITY
VERNON
MONTEBELLO
COMMERCE
LA PUENTE
WALNUT
INDUSTRY
HUNTINGTON PARK
BELL
BELL GARDENS
SOUTH GATE
PICO RIVERA
WHITTIER
INGLEWOOD
SANTA FE SPRINGS
LOS ANGELES
ORANGE
LA HABRA
BREA
EL SEGUNDO
MANHATTAN BEACH
HAWTHORNE
LAWNDALE
COMPTON
GARDENA
PARAMOUNT
LA MIRADA
FULLERTON
PLACENTIA
HERMOSA BEACH
BUENA PARK
CERRITOS
REDONDO BEACH
TORRANCE
LAKEWOOD
ANAHEIM
CYPRESS
PALOS VERDES ESTATES
ROLLING HILLS ESTATES
ROLLING HILLS
LOS ALAMITOS
STANTON
ORANGE
LONG BEACH
GARDEN GROVE
WESTMINSTER
SANTA ANA
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA
SAN GABRIEL
HARBOR FRWY
LONG BEACH FRWY
SAN DIEGO
NEWPORT FRWY

Figure 46. Mobile Lidar route map
Mission day 11/7/73

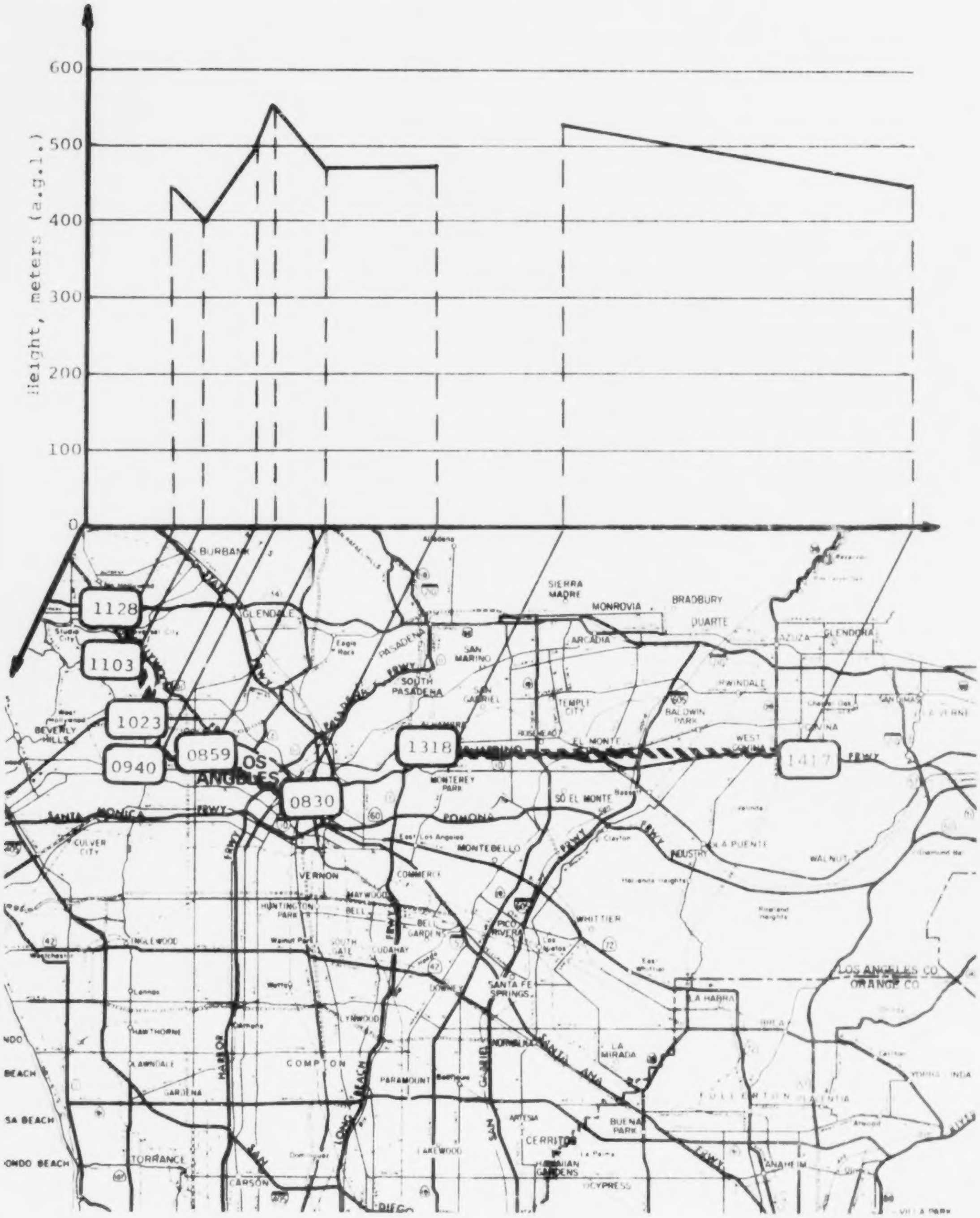


Figure 47. Mixing layer height along observational route
Mission day 11/7/73

SECTION VIII

GLOSSARY

W_x	Weather
H	Haze
K	Smoke
F	Fog
GF	Ground Fog
R	Rain
D	Dust
BD	Blowing Dust
L	Drizzle
+	Stronger
-	Weaker
--	Very Weak
BN	Blowing Sand

	Sky
cy	Cloudy
CLR	Clear

W_d	Wind Direction
W_s	Wind Speed
DD	Pts.
ff	Miles Per Hour

DIR.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
ARROW	↓	↓↙	↙	↙←	←	←↖	↖	↑↖	↑	↗↑	↗	→↗	→	→↘	↘	↘↓
DEG.	360	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338
PTS.	16	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

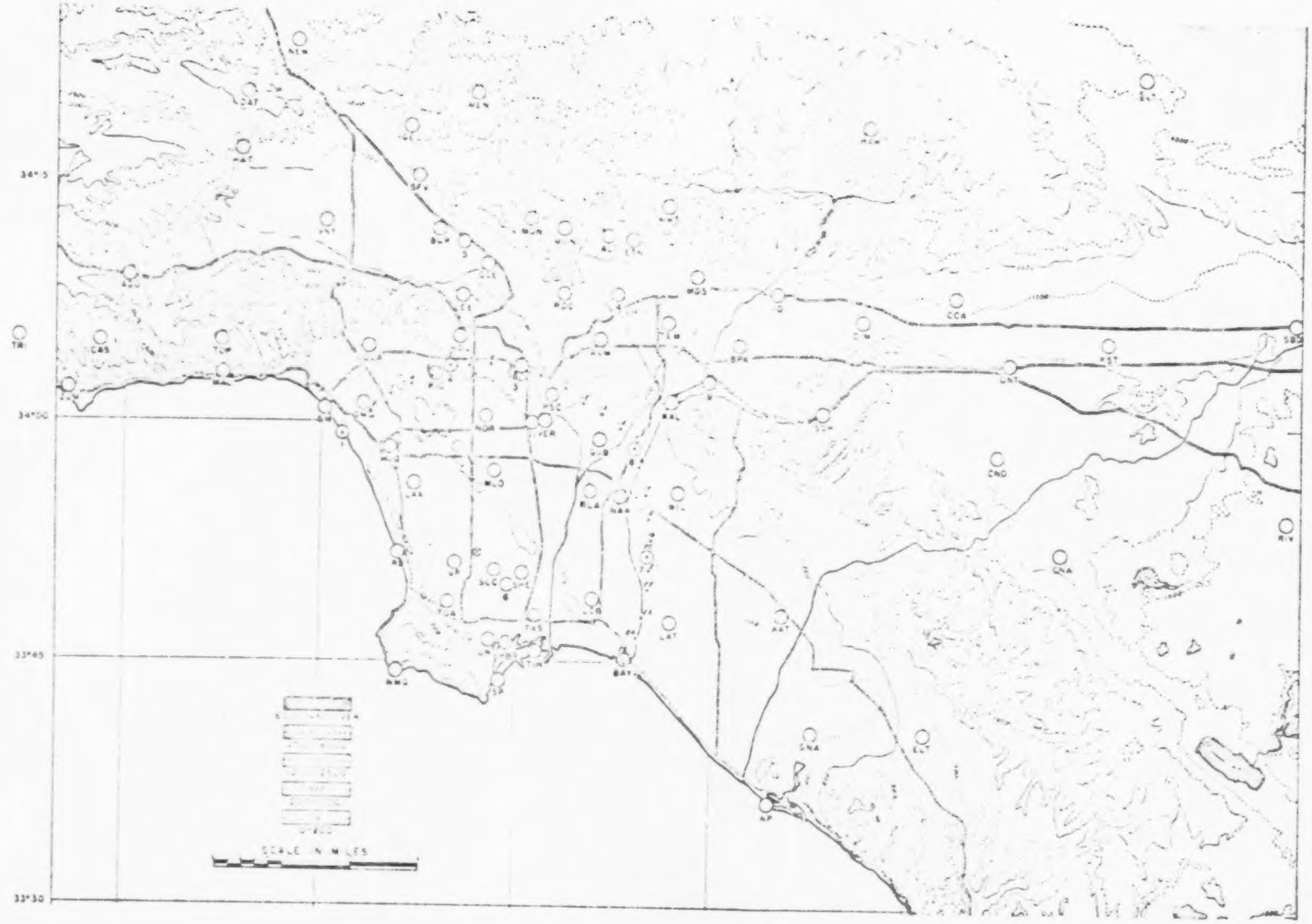
SECTION IX

APPENDIXES

		Page
A.	Topography Map of Los Angeles Basin	148
B.	Daily Weather Data at LAX, Burbank and Long Beach	151
C.	LARPP Program Launch Site Data	172
D.	Radiosonde Data Summary Los Angeles International Airport Station	181
E.	Radiosonde Data Summary El Monte Station	192
F.	Daily Summary of Weather Data	199

APPENDIX A

TOPOGRAPHY MAP OF LOS ANGELES BASIN


34°15
34°00
33°45
33°30
TRI
CBS
TOP
MAL
SM
LAX
VER
RAL
MOS
CCA
ONT
CNO
RIV
CNA
NP
BAY
LAT
SP
SCALE IN MILES

APPENDIX B

DAILY WEATHER DATA AT LAX, BURBANK AND LONG BEACH

Preceding page blank

DAILY WEATHER DATA

Year 1973 Month Oct. Day 05

L.A. International Airport

	V	Wx	RH	T	DP	DD	ff
	00		76	74	75	86	84
00						4	5
01						4	5
02						4	5
03						4	6
04						3	2
05						7	5
06	005	GFH	97	59	58	4	6
07	005	FH	97	59	58	9	6
08	010	FK	97	59	58	4	5
09	010	FK	93	61	59	5	3
10	010	HK	81	64	58	7	3
11	018	HK	70	68	58	4	3
12	020	HK	66	70	58	11	6
13	025	HK	68	69	58	11	12
14	025	HK	68	69	58	11	10
15	030	HK	73	67	58	11	10
16	040	HK	81	64	58	11	9
17	040	HK	84	62	57	11	9
18	040	HK	84	62	57	11	7
19	050	HK	84	62	57	12	5
20						7	3
21						4	6
22						7	5
23						5	6
99	987	008	020	66	75	252	043

Burbank

	V	Wx	RH	T	DP	DD	ff
	00		75	74	75	86	84
00						8	3
01						15	5
02						15	3
03						15	5
04						14	3
05						14	5
06	040	H	77	54	47	15	2
07	025	HK	80	56	50	4	6
08	002	F	100	56	56	8	9
09	008	F	90	60	57	6	8
10	015	FH	75	65	57	6	8
11	015	FH	68	69	58	7	9
12	015	FH	64	72	59	6	6
13	015	FH	58	74	58	8	9
14	015	FH	58	74	58	8	12
15	020	HK	60	73	58	8	13
16	020	HK	68	69	58	8	14
17	025	HK	75	65	57	8	12
18	025	HK	76	62	55	8	9
19	025	HK	89	61	57	7	7
20						6	7
21						6	7
22						6	7
23						8	5
99	015	138	015	58	74	824	070

Long Beach

	V	Wx	RH	T	DP	DD	ff
	00		76	74	75	86	84
00						10	1
01						8	1
02						4	1
03						1	1
04						8	3
05						15	3
06	010	FHK	81	61	55	5	3
07	010	HK	81	61	55	4	6
08	012	HK	81	61	55	4	1
09	012	HK	75	63	55	8	3
10	015	HK	70	65	55	7	9
11	020	HK	70	65	55	8	9
12						8	8
13	020	HK	68	66	55	8	13
14	020	HK	70	65	55	8	9
15	025	HK	65	66	54	8	9
16	030	HK	70	64	54	8	12
17	030	HK	75	62	54	7	8
18	030	HK	75	61	53	7	7
19						6	7
20						6	9
21						7	5
22						4	6
23						4	7
99	987	008	020	65	67	322	052

	V	Wx	RH	T	DP	DD	ff
	00		76	74	75	86	84

700333

5¼x8
P152

DAILY WEATHER DATA

Year 1973 Month Oct. Day 10

	L.A. International Airport							Burbank							Long Beach													
	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff
	80		76	74	75	86	84	80		76	74	75	86	84	80		76	74	75	86	84	80		76	74	75	86	84
00						4	5						5	3						8	1							
01						4	5						3	6						2	1							
02						3	6						11	5						3	1							
03						2	6						16	3						10	1							
04						7	3						1	6						10	1							
05						4	5						3	6						15	1							
06	040	HK	86	55	51	3	6	500		80	52	46	4	6	080		80	53	47	12	3							
07	040	HK	83	57	52	3	6	500		66	53	42	3	5	040	HK	83	55	50	15	5							
08	060	HK	81	61	55	7	2	500		49	61	42	13	3	040	HK	75	61	53	16	6							
09	100		56	67	51	12	6	500		36	66	38	6	7	040	HK	56	67	51	13	3							
10	120		51	70	51	6	5	500		35	69	40	7	9	050	HK	42	70	46	16	6							
11	200		49	71	51	12	9	500		42	71	47	8	7	100		47	73	52	9	12							
12	250		47	71	50	11	12	500		34	74	44	6	12	140		37	74	46	8	10							
13	250		57	70	54	12	13	500		37	75	47	8	7	140		24	76	37	10	12							
14	250		42	71	47	12	14	500		50	74	54	8	18	140		23	76	36	9	15							
15	300		39	72	46	11	13	500		28	74	39	7	17	300		36	75	46	12	16							
16	300		41	71	46	11	17	500		31	72	40	7	15	250		25	74	36	14	17							
17	300		49	69	49	11	18	500		31	71	39	6	12	450		31	71	39	12	13							
18	300		48	66	46	12	12	500		37	67	40	8	7	450		34	68	38	12	7							
19	250		48	66	46	12	9	155		32	65	34	12	5	305		52	65	47	11	8							
20						11	6						15	6						11	8							
21						11	5						12	8						2	7							
22						10	3						15	5						12	1							
23						4	3						5	5						2	1							
99	100	090	100	39	73	224	057	155	190	155	28	75	227	062	040	090	040	23	78	678	058							

DAILY WEATHER DATA

Year 1973 Month Oct. Day 11

	L.A. International Airport							Burbank							Long Beach													
	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff
	[illegible]		75	71	75	66	64	[illegible]		75	[illegible]	75	66	64	[illegible]		75	74	75	66	64	[illegible]		76	74	75	66	64
00						4	5						5	5						6	1							
01						4	5						15	3						4	1							
02						4	5						15	5						1	1							
03						4	3						1	3						12	1							
04						3	5						15	6						1	3							
05						2	2						15	5						15	3							
06	120		61	55	42	4	5	400		58	49	35	15	6	120		61	53	40	16	1							
07	100		57	57	42	2	7	400		50	51	34	6	5	120		57	55	40	16	3							
08	050	HK	43	63	40	4	6	250		43	58	36	10	3	070		48	60	40	1	2							
09	050	HK	36	68	40	16	3	250		33	66	36	12	3	060	HK	43	65	42	4	2							
10	050	HK	31	72	40	11	3	200		29	70	37	6	6	060	HK	35	71	42	6	3							
11	040	HK	34	73	43	11	12	200		28	73	38	8	6	050	HK	41	73	48	8	9							
12	050	HK	41	72	47	11	12	200		23	76	36	7	6	080		46	74	52	9	10							
13	060	HK	47	70	49	11	13	200		22	78	36	8	9	140		39	75	48	8	14							
14	060	HK	51	71	52	11	13	200		19	80	34	8	9	140		28	79	43	12	9							
15	120		59	69	54	11	14	200		24	78	39	8	12	140		40	75	49	13	15							
16	140		63	68	55	12	14	200		27	75	39	7	12	250		43	72	48	13	10							
17	140		73	66	57	11	12	300		38	70	43	6	9	250		51	69	50	13	13							
18	140		81	63	57	12	10	400		44	68	45	9	7	305		65	65	53	13	9							
19	140		81	63	57	11	7	155		48	66	45	15	6	305		70	63	53	13	7							
20						11	6						14	8						15	3							
21						11	3						14	7						5	3							
22						7	3						12	5						7	3							
23						4	3						1	5						2	3							
99	040	110	040	31	73	212	060	155	190	155	19	80	835	048	050	110	050	28	80	881	033							

7603

DAILY WEATHER DATA

Year 1973 Month Oct. Day 12

	L.A. International Airport							Burbank							Long Beach													
	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff
	CO		76	74	75	26	24	CO		76	74	75	26	24	CO		76	74	75	26	24	CO		76	74	75	26	24
00						4	3						6	5						2	6							
01						4	5						1	3						4	3							
02						4	5						16	7						3	1							
03						4	5						16	6						11	1							
04						4	3													15	1							
05						4	3						14	3						16	1							
06	040	HK	90	56	53	4	6	150		58	50	36	11	9	050	HK	77	51	44	9	1							
07	040	HK	80	57	51	4	5	150		56	52	37	16	5	050	HK	69	56	46	9	1							
08	030	HK	67	61	50	5	7	150		39	62	37	12	3	060	HK	60	61	47	5	1							
09	030	HK	51	68	49	4	3	150		41	66	42	6	8	060	HK	56	66	50	2	1							
10	030	HK	44	71	48	5	3	150		32	72	41	6	7	080		46	72	50	9	5							
11	040	HK	49	72	52	11	9	100		28	77	42	8	7	080		48	74	53	9	5							
12	050	HK	55	72	55	12	10	070		26	79	41	8	8	080		45	77	54	9	9							
13	120		57	72	56	12	10	070		24	80	40	8	9	080		40	77	51	8	12							
14	120		59	71	56	11	12	050	H	28	82	46	7	7	120		36	79	50	8	10							
15	120		59	71	56	11	12	050	H	26	81	43	8	12	140		38	79	51	13	12							
16	140		63	70	57	11	10	100		28	80	44	8	10	140		38	76	48	12	16							
17	140		76	67	59	12	10	100		37	75	47	8	10	140		44	72	49	13	7							
18	140		84	64	59	12	7	100		42	70	46	11	6	140		51	67	48	13	9							
19	140		87	63	59	12	9	100		44	70	47	16	7	140		63	65	52	14	6							
20						10	5						13	6						14	5							
21						10	2						15	8						2	3							
22						9	5						14	3						4	3							
23						4	5						7	8						8	1							
99	030	080	030	44	73	223	055	050	140	050	24	82	686	065	060	080	050	36	81	553	023							

DAILY WEATHER DATA

Year 1973 Month Oct. Day 15

	L.A. International Airport							Burbank							Long Beach													
	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff
	00		75	74	75	26	24	00		75	74	75	26	24	00		75	74	75	26	24	00		75	74	75	26	24
00						12	5						16	3						13	7							
01						11	3						15	5						12	5							
02						12	3													14	5							
03						10	3						11	5						15	6							
04						3	2						15	5						14	3							
05						1	2						11	5						16	5							
06	002	F	97	57	56	10	6	100		57	55	40	15	7	000	F	86	56	52	13	6							
07	005	F	97	57	56	13	3	150		51	58	40	7	3	002	F	86	56	52	12	6							
08	005	F	100	56	56	12	5	100		44	67	44	6	5	005	F	87	57	53	13	6							
09	008	F	93	58	56	11	6	100		66	70	58	7	6	010	F	78	60	53	14	3							
10	020	HK	81	62	56	11	7	100		32	75	43	7	5	015	HK	63	67	54	14	6							
11	030	HK	81	62	56	11	9	100		26	82	43	7	7	020	HK	57	71	55	8	9							
12	030	HK	81	62	56	11	10	050	HK	30	85	50	8	9	040	HK	48	76	55	11	9							
13	030	HK	73	65	56	12	12	050	HK	29	87	51	7	8	050	HK	52	74	55	13	10							
14	080		68	67	56	12	13	070		27	87	49	8	9	050	HK	48	75	54	12	10							
15	080		73	66	57	11	14	150		27	87	49	8	12	050	HK	52	73	54	14	12							
16	080		78	64	57	12	9	200		30	84	49	7	12	070		57	70	54	15	13							
17	080		84	62	57	12	12	250		41	79	53	7	8	100		56	68	52	13	9							
18	080		89	61	57	11	10	250		48	75	54	7	3	150		64	64	52	13	8							
19	070		89	61	57	11	7	155		57	71	55	14	8	120		78	61	54	14	6							
20						11	6						16	6						16	3							
21						7	2						8	6						1	3							
22						7	3						16	3						7	1							
23						7	2						3	3						13	3							
99	987	005	080	68	68	576	060	050	120	050	26	87	843	055	020	116	015	48	77	767	060							

7003

DAILY WEATHER DATA

Year 1973 Month Oct. Day 16

	L.A. International Airport							Burbank							Long Beach													
	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff
	80		76	74	75	86	84	80		75	74	75	86	84	80		76	74	75	86	84	80		76	74	75	86	84
00						11	3						15	5						13	1							
01						9	3						14	3						15	1							
02						12	3						14	3						15	1							
03						11	2						13	3						14	5							
04						13	2						13	3						14	5							
05						14	3						15	3						14	1							
06	000	F	100	58	58	3	2	250		57	55	40	15	5	001	F	93	56	54	7	1							
07	002	F	100	58	58	10	2	400		53	58	41	12	3	001	F	93	56	54	8	3							
08	008	GF	100	58	58	10	2	250		44	64	42	1	3	001	F	90	57	54	7	1							
09	010	GF	87	63	59	11	6	200		34	73	43	6	6	008	GF	87	60	56	12	3							
10	010	HK	84	63	58	12	7	150		29	79	44	6	6	010	HK	76	67	59	8	3							
11	012	HK	78	65	58	11	8	150		23	82	41	6	7	015	HK	64	72	59	9	5							
12	015	HK	75	65	57	11	10	150		19	88	41	7	12	030	HK	64	72	59	8	8							
13	025	HK	73	65	56	11	9	100		22	90	46	8	12	030	HK	58	75	59	8	8							
14	030	HK	76	62	55	12	10	100		20	90	43	8	9	030	HK	60	74	59	7	7							
15	030	HK	75	63	55	11	9	100		20	90	43	7	12	030	HK	46	81	58	13	5							
16	008	F	87	60	56	12	12	100		16	88	37	5	8	030	HK	47	77	55	13	7							
17	002	F	90	59	56	12	9	100		26	85	46	6	9	030	HK	61	68	54	13	8							
18	004	VF	93	58	56		7	150		22	78	37	5	9	025	HK	78	61	54	13	9							
19	004	VF	93	58	56	11	6	100		40	76	50	14	6	025	HK	81	60	54	13	6							
20						12	7						1	5						13	7							
21						12	5						13	5						13	7							
22						12	5						11	3						12	7							
23						12	5						15	5						14	7							
99	987	008	987	73	66	255	045	100	130	100	16	90	861	050	030	138	015	46	81	444	027							

DAILY WEATHER DATA

Year 1973 Month Oct. Day 17

	L.A. International Airport							Burbank							Long Beach													
	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff
	CO		76	74	75	85	84	CO		76	74	75	85	84	CO		76	74	75	85	84	CO		76	74	75	85	84
00						12	3						15	5						13	6							
01						14	2						15	5						14	6							
02						11	2						15	5						16	1							
03						11	5						15	5						12	5							
04						11	6						15	5						13	6							
05						13	6						15	5						14	7							
06	001		100	54	54	14	3	150		53	57	40	14	5	002	F	93	54	52	15	6							
07	020	GF HK	100	53	53	3	2	200		53	59	42	14	3	005	GF	93	54	52	13	3							
08	030	HK	84	60	55	11	6	200		41	69	44	12	3	015	HK	84	59	54	13	3							
09	030	HK	34	60	55	12	9	200		41	70	45	3	6	015	HK	65	67	55	11	5							
10	050	HK	70	65	55	12	8								015	HK	45	77	54	14	7							
11	050	HK	61	69	55	11	9	400		17	90	40	8	6	030	HK	38	82	54	12	5							
12	060	HK	59	70	55	11	10	400		15	93	38	10	5	040	HK	32	87	53	13	6							
13	080		57	71	55	11	12	400		14	94	38	4	6	040	HK	35	86	55	13	8							
14	080		53	72	54	12	12	400		15	94	39	7	9	050	HK	41	82	56	12	14							
15	080		59	70	55	11	10	400		17	93	42	8	12	100		33	83	51	13	13							
16	080		65	68	56	11	12	400		16	91	39	8	9	140		39	77	50	13	13							
17	200		70	66	56	12	9	400		17	88	38	13	12	200		46	73	51	13	12							
18	140		75	64	56	11	6	155		22	82	40	14	9	200		51	69	50	14	7							
19	140		78	63	56	12	5	155		24	80	40	11	3	140		53	68	50	14	6							
20						11	3						16	3						14	7							
21						9	3						14	12						1	5							
22						4	3						14	9						7	1							
23						7	2						15	12						8	1							
99	060	122	050	53	73	726	062	150	060	150	14	94	776		015	105	015	32	89	877	048							

DAILY WEATHER DATA

Year 1973 Month Oct. Day 18

	L.A. International Airport							Burbank							Long Beach													
	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff
	CO		75	74	75	[illegible]	24	CO		75	74	75	26	24	CO		76	74	75	85	24	CO		75	74	75	[illegible]	24
00						4	3						15	9						16	5							
01						4	3						16	5						13	5							
02						4	2						7	5						13	6							
03						12	5						1	6						12	3							
04						14	5						8	6						14	1							
05						11	3						6	6						16	5							
06	040	HK	84	62	57	12	2	400		44	64	42	13	5	060	HK	70	63	53	16	3							
07	040	HK	84	63	58	12	3	500		45	66	44	16	5	060	HK	65	66	54	15	7							
08	100		62	72	58	12	3	500		37	73	45	7	5	050	HK	53	70	52	15	5							
09	080		53	73	55	12	5	500		32	78	46	8	5	030	HK	43	75	51	12	1							
10	080		38	81	53	16	3	500		26	85	47	8	6	025	HK	34	82	51	13	3							
11	080		41	79	53	11	9	500		23	89	46	7	6	025	HK	29	87	51	13	5							
12	070		42	78	53	11	10	500		18	93	43	8	7	025	HK	33	89	56	8	7							
13	100		45	76	53	11	9	500		20	94	47	8	8	070		28	91	53	9	13							
14	100		53	73	55	11	12	500		16	94	42	8	14	100		27	88	50	13	15							
15	200		46	73	51	11	15	500		17	95	43	11	9	200		22	84	41	12	16							
16	200		55	71	54	11	9	500		26	91	38	12	17	200		25	81	42	14	14							
17	200		44	71	48	11	8	500		15	87	34	13	14	200		31	78	45	13	9							
18	200		53	68	50	11	7	250		17	83	34	14	9	200		31	74	42	13	10							
19	150		53	69	50	11	8	155		20	80	36	14	9	140		41	71	46	14	6							
20						14	5						-	-						16	6							
21						11	7						13	9						7	1							
22						5	5						14	7						8	1							
23						9	3						16	9						12	3							
	070	120	070	38	84	666	042	155	190	155	15	95	784	053	025	103	025	22	93	888	040							

DAILY WEATHER DATA

Year 1973 Month Oct. Day 24

L.A. International Airport

	V	Wx	RH	T	DP	DD	ff
	60		76	74	75	36	34
00						4	3
01						4	3
02						5	3
03						4	5
04						5	2
05						6	2
06	150		86	54	50	5	3
07	120		83	55	50	3	3
08	120		75	59	51	4	6
09	120		63	65	52	1	3
10	120		53	68	50	9	5
11	080		46	72	50	11	9
12	100		51	71	52	12	10
13	120		47	71	50	12	12
14	120		51	70	51	11	13
15	300		53	69	51	11	13
16	300		54	68	51	11	13
17	300		60	66	52	11	9
18	150		64	64	52	10	5
19	150		68	64	53	7	3
20						3	5
21						5	5
22						4	7
23						4	8
	[illegible]	[illegible]	[illegible]	RH MIN	T MAX	DD 6-9	ff 6-12
99	080	110	080	46	73	322	148

Burbank

	V	Wx	RH	T	DP	DD	ff
	60		76	74	75	36	34
00						15	5
01						9	28
02						15	5
03						15	5
04						15	5
05						14	5
06	200		83	50	45	12	5
07	500		83	51	46	4	3
08	500		72	58	49	8	3
09	500		63	64	51	15	3
10	250		54	68	51	5	6
11	250		49	71	51	8	6
12	250		41	75	50	6	6
13	250		46	80	57	8	6
14	500		29	82	47	4	3
15	500		36	79	50	6	13
16	500		38	78	50	6	12
17	500		46	73	51	5	16
18	250		49	70	50	6	9
19	155		56	67	51	16	6
20						15	6
21						4	3
22						4	6
23						4	6
	[illegible]	[illegible]	[illegible]	RH MIN	T MAX	DD 6-9	ff 6-12
99	155	190	155	29	82	624	143

Long Beach

	V	Wx	RH	T	DP	DD	ff
	60		76	74	75	36	34
00						3	1
01						7	1
02						8	1
03						16	1
04						15	1
05						15	3
06	100		83	53	48	15	1
07	100		77	55	48	16	1
08	070		69	60	50	4	5
09	070		64	64	52	1	1
10	070		53	69	51	16	3
11	070		44	73	50	13	5
12	070		40	77	51	12	3
13	080		50	77	57	9	9
14	070		47	77	55	13	1
15	070		48	75	54	12	13
16	100		43	73	49	13	12
17	350		51	69	50	13	10
18	305		53	67	49	15	9
19	305		56	65	49	5	5
20						6	5
21						6	6
22						4	5
23						3	5
	[illegible]	[illegible]	[illegible]	RH MIN	T MAX	DD 6-9	ff 6-12
99	070	100	070	43	80	882	027

	V	Wx	RH	T	DP	DD	ff
	60		76	74	75	36	34
00							
01							
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
99							

7003

DAILY WEATHER DATA

Year 1973 Month Oct. Day 25

	L.A. International Airport							Burbank							Long Beach													
	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff
	80		76	74	75	86	84	80		76	74	75	86	84	80		76	74	75	86	84	80		76	74	75	86	84
00						3	7						4	6						4	6							
01						4	5						4	6						3	1							
02						3	5						1	6						7	1							
03						3	5						1	6						16	3							
04						2	5						15	5						10	1							
05						5	5						16	5						13	1							
06	050	HK	90	56	53	2	5	400		61	50	37	15	6	040	HK	80	55	49	7	1							
07	040	HK	87	57	53	3	5	400		66	52	41	14	5	025	FHK	80	56	50	16	3							
08	040	HK	75	62	54	5	6	400		56	59	43	7	3	020	HK	75	60	52	2	3							
09	040	HK	68	66	55	6	6	250		48	65	45	6	8	020	HK	63	66	53	1	3							
10	050	HK	55	70	53	4	5	250		41	70	45	6	8	030	HK	55	70	53	6	5							
11	060	HK	51	71	52	11	10	200		37	75	47	6	6	050	HK	59	72	57	8	12							
12	070		55	71	54	11	10	150		31	79	46	6	12	060	HK	55	73	56	9	10							
13	070		61	70	56	11	12	050	H	35	80	50	6	12	070		50	74	54	10	9							
14	070		65	69	57	12	10	050	H	42	79	54	7	12	070		53	73	55	9	10							
15	070		68	68	57	11	9	060	HK	44	77	53	7	9	070		57	72	56	8	9							
16	002	FK	87	62	58	12	8	070		41	76	51	7	8	070		63	70	57	8	8							
17	002	FK	90	60	57	12	7	150		49	71	51	7	9	050	HK	70	67	57	13	9							
18	010	FK	93	58	56	9	3	150		49	70	50	6	8	040	HK	78	63	56	14	9							
19	030	GFK	97	57	56	14	2	100		61	67	53	16	8	040	HK	81	61	55	15	3							
20						7	3						6	8						5	3							
21						5	3						5	3						4	6							
22						3	2						4	9						5	7							
23						4	6						4	5						4	1							
99	050	103	040	51	74	123	062	050	130	050	31	80	874	060	030	103	020	50	75	481	045							

DAILY WEATHER DATA

Year 1973 Month Oct. Day 26

	L.A. International Airport								Burbank								Long Beach														
	V	Wx	RH	T	DP	DD	ff		V	Wx	RH	T	DP	DD	ff		V	Wx	RH	T	DP	DD	ff		V	Wx	RH	T	DP	DD	ff
	80		76	74	75	86	84		80		76	74	75	86	84		80		76	74	75	86	84		80		76	74	75	86	84
00						4	3							4	5							2	3								
01						4	3							2	5							3	1								
02						4	7							15	6							3	5								
03						4	8							15	5							1	3								
04						3	5							15	5							4	1								
05						2	7							15	5							4	6								
06	025	HK	93	58	56	3	6		050	HK	80	51	45	15	5		020	GF HK	90	58	55	4	5								
07	010	GF HK	97	58	57	4	6		070		66	52	41	8	3		010	GF HK	90	58	55	5	1								
08	015	GF HK	87	61	57	4	5		070		62	57	44	12	3		010	GF HK	87	60	56	2	3								
09	025	HK	75	65	57	4	5		070		58	63	48	13	3		015	HK	78	63	56	2	5								
10	025	HK	61	70	56	11	5		100		41	70	47	6	6		025	HK	65	69	57	14	6								
11	025	HK	61	71	57	12	8		100		39	75	48	7	9		040	HK	59	72	57	13	5								
12	025	HK	64	71	58	12	9		100		26	80	42	7	9		040	HK	54	76	58	10	8								
13	030	HK	66	70	58	11	9		150		22	84	41	8	6		050	HK	68	71	60	9	13								
14	030	HK	70	69	59	11	12		050	HK	35	82	52	7	12		050	HK	62	73	59	8	10								
15	005	FK	81	64	58	12	10		040	HK	33	83	51	8	12		060	HK	58	76	60	13	9								
16	030	HK	81	64	58	12	12		100		28	83	47	8	8		025	HK	68	69	58	13	9								
17	060	HK	73	64	55	12	13		250		24	81	41	8	5		025	HK	73	66	57	13	8								
18	060	HK	78	62	55	11	7		150		31	76	43	14	5		030	HK	70	65	55	13	6								
19	060	HK	84	62	57	10	5		150		27	71	35	15	6		030	HK	73	63	54	15	5								
20						4	5							4	6							5	3								
21						6	3							4	5							7	3								
22						2	5							4	5							1	5								
23						4	3							7	3							16	1								
	[illegible]	[illegible]	[illegible]	RH MIN	T MAX	DD 6-9	ff 6-12		[illegible]	T av	[illegible]	RH MIN	T MAX	DD 6-9	ff 6-12		[illegible]	T av	[illegible]	RH MIN	T MAX	DD 6-9	ff 6-12								
99	987	007	025	61	72	222	058		070	090	070	22	84	846	048		040	117	025	54	77	231	042								

DAILY WEATHER DATA

Year 1973 Month Oct. Day 27

	L.A. International Airport							Burbank							Long Beach													
	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff
	80		75	74	75	86	84	80		75	74	75	86	84	80		76	74	75	86	84	80		76	74	75	86	84
00						4	6						16	5						4	1							
01						4	6						16	5						4	1							
02						16	3						13	3						8	1							
03						4	5						16	6						14	5							
04							1						16	6						12	1							
05						5	2						16	3						13	5							
06	040	HK	86	55	51	3	5	150		48	55	36	16	7	010	GF	100	54	54	13	5							
07	040	HK	77	58	51	4	5	500		45	55	34	6	3	010	GF	97	55	54	14	6							
08	040	HK	60	65	51	4	3	500		37	67	40	13	5	015	GF	84	61	56	12	6							
09	080		30	77	43	2	6	500		36	72	43	7	6	025	GF	55	71	54	15	8							
10	140		21	84	40	4	6	500		20	80	35	7	6	040	HK	31	82	48	15	7							
11	140		17	88	38	1	5	500		13	85	29	7	7	060	HK	22	82	40	15	10							
12	060	HK	24	80	40	11	9	500		12	90	31	7	9	250		15	93	39	14	12							
13	080		26	84	45	12	8	500		10	94	29	11	12	250		13	94	36	15	9							
14	080		26	82	44	11	9	500		10	95	29	12	9	250		04	95	12	13	8							
15	200		22	82	40	11	9	500		10	95	29	12	12	250		20	91	45	12	14							
16	200		33	76	45	11	9	500		10	93	28	15	14	250		20	86	40	12	12							
17	300		46	71	49	12	8	500		9	88	24	13	6	250		26	80	42	12	13							
18	140		56	67	51	11	5	155		15	81	29	6	6	150		39	71	45	14	8							
19	140		59	68	53		1	155		23	76	36	14	5	150		49	68	48	1	5							
20						3	3						12	5						2	3							
21						5	2						10	5						11	3							
22						3	6						10	5						15	5							
23						16	2						12	5						13	6							
99	040	080	040	17	91	222	050	150	060	150	9	95	837	057	025	094	025	04	96	776	070							

DAILY WEATHER DATA

Year 1973 Month Oct. Day 29

	L.A. International Airport							Burbank							Long Beach													
	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff
	80		76	74	75	86	84	80		76	74	75	86	84	80		76	74	75	86	84	80		76	74	75	86	84
00						5	3						15	5						16	6							
01						6	2						16	3						12	1							
02						16	3						8	5						7	3							
03						1	2													4	5							
04						4	3						14	3						11	1							
05						4	5						16	3						1	3							
06	200		59	55	41	7	5	250		31	53	24	16	8	400		53	55	38	6	3							
07	200		59	56	42	8	5	400		25	59	24	11	6	150		52	54	37	5	3							
08	120		40	65	40	7	2	250		19	68	25	8	9	050	K	41	63	39	2	6							
09	060	HK	28	70	36	4	5	150		15	75	25	8	9	050	K	41	71	46	7	6							
10	060	HK	28	74	39	4	6	150		20	78	34	7	7	070		40	75	49	8	10							
11	080		27	78	41	7	7	150		15	80	28	6	8	070		44	75	52	8	12							
12	080		29	80	45	5	7	150		14	83	30	6	7	080		41	77	52	7	5							
13	080		22	83	40	8	6	100		14	84	30	8	6	090		34	81	50	8	7							
14	080		48	77	56	11	8	070		16	85	33	6	12	090		35	80	50	8	7							
15	100		47	77	55	11	9	080		20	85	40	8	9	090		31	82	48	8	6							
16	100		53	73	55	11	9	100		21	83	39	8	9	140		34	80	49	6	5							
17	100		70	67	57	11	8	400		18	81	34	7	6	140		50	75	55	8	5							
18	100		73	65	56	9	3	200		24	77	37	16	7	070		53	70	52	14	8							
19	100		68	65	54	9	5	155		22	75	33	16	8	070		56	68	52	12	5							
20						4	6						9	6						13	3							
21						16	5						16	6						15	5							
22						4	2						16	12						13	5							
23						13	5						2	3						14	7							
99	060	090	060	22	84	444	050	070	140	070	14	85	864	078	050	080	050	31	84	331	067							

DAILY WEATHER DATA

Year 1973 Month Oct. Day 30

	L.A. International Airport								Burbank								Long Beach															
	V	Wx	RH	T	DP	DD	ff		V	Wx	RH	T	DP	DD	ff		V	Wx	RH	T	DP	DD	ff		V	Wx	RH	T	DP	DD	ff	
	80		76	74	75	86	84		80		76	74	75	86	84		80		76	74	75	86	84		80		76	74	75	86	84	
00						12	2							16	8							16	1									
01						12	3							8	6							13	7									
02						13	2							16	5							15	5									
03						6	5															7	1									
04						9	2															8	1									
05						4	5															13	6									
06	100		47	57	37	4	5		250		21	59	21	15	7		040	HK	55	55	38	13	6									
07	060	HK	42	59	36	14	3		500		20	59	20	1	5		050	HK	55	54	38	13	6									
08	060	HK	31	68	36	5	5		300		20	67	25	3	5		040	HK	43	63	40	12	7									
09	080		21	73	32	5	3		250		20	71	28	6	6		030	K	26	75	37	14	8									
10	060	HK	12	80	24	3	5		250		11	78	22	6	8		030	K	17	80	32	14	5									
11	050	HK	09	84	18	7	7		250		14	82	29	7	12		040	HK	14	84	31	13	6									
12	070		13	86	29	11	9		250		11	84	24	6	9		060	HK	07	87	17	13	1									
13	120		20	82	37	11	12		250		10	85	24	6	12		080		04	90	08	9	1									
14	140		25	79	40	12	12		250		10	85	24	6	9		100		8	87	21	8	8									
15	200		13	90	33	12	11		400		10	85	23	6	9		100		14	87	32	12	10									
16	200		22	77	35	12	14		400		10	84	22	6	9		100		15	83	32	13	12									
17	300		41	71	46	12	12		400		10	78	19	8	6		100		18	76	29	13	10									
18	140		53	68	50	12	9		400		14	76	24	16	6		140		23	71	32	14	10									
19	140		51	68	49	11	5		250		11	76	18	15	12		140		34	68	38	14	7									
20						11	7							15	7							3	5									
21						8	3							16	7							4	3									
22						6	5							16	10							4	3									
23						16	3							8	5							14	6									
24	050	110	050	09	87	273	047		250	060	250	10	85	712	072		030	080	030	04	91	776	063									

760333

DAILY WEATHER DATA

Year 1973 Month Oct. Day 31

	L.A. International Airport							Burbank							Long Beach													
	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff
	80		76	74	75	86	84	80		76	74	75	86	84	80		76	74	75	86	84	80		76	74	75	86	84
00							1													2	3							
01						3	6						16	5						16	5							
02						5	3						16	5						13	1							
03						5	5						15	5						11	1							
04						6	3						14	3						4	1							
05						7	3						15	3						9	1							
06	150		57	55	40	4	6	250		22	58	21	15	5	500		61	51	38	13	5							
07	140		39	60	35	2	5	250		33	57	28	15	5	150		61	53	40	10	1							
08	120		33	65	35	5	6	500		26	66	31	13	3	050	HK	30	63	32	3	3							
09	120		27	72	37	4	7	500		22	72	31	8	7	050	HK	27	71	35	2	1							
10	100		21	77	34	4	8	200		18	78	32	6	6	080		22	76	35	8	8							
11	100		14	82	29	3	5	200		14	82	28	7	6	100		20	79	35	9	6							
12	100		50	76	56	12	9	150		13	85	28	9	3	120		18	80	33	9	7							
13	100		53	75	57	11	8	100		12	86	28	8	8	150		17	80	32	9	8							
14	100		47	75	53	11	10	100		14	86	31	6	10	150		20	80	35	8	10							
15	100		30	77	43	11	9	100		18	85	37	7	12	150		17	80	32	8	9							
16	100		46	73	51	11	9	070		28	71	37	8	8	120		31	78	45	7	6							
17	100		51	69	50	11	9	070		22	75	33	5	9	140		33	74	43	14	12							
18	120		58	66	51	11	8	030	HK	24	75	35	6	9	140		41	68	43	14	9							
19	120		58	65	50	11	6	060	HK	26	72	35	5	5	080		43	65	42	14	3							
20						7	3						5	7						6	3							
21						5	3						2	5						8	5							
22						7	3						4	6						8	8							
23						4	3						4	6						2	3							
	VEC	T VV	VEC	RH MIN	T MAX	DD 6-9	FF 6-12	VEC	T VV	VEC	RH MIN	T MAX	DD 6-9	FF 6-12	VEC	T VV	VEC	RH MIN	T MAX	DD 6-9	FF 6-12							
99	100	110	100	14	83	213	062	030	180	030	12	86	887	053	050	080	050	17	81	752	040							

700

DAILY WEATHER DATA

Year 1973 Month Nov. Day 01

	L.A. International Airport							Burbank							Long Beach													
	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff
	50		75	74	75	[illegible]	24	50		75	74	75	65	34	80		76	71	75	86	34	50		76	71	75	85	34
00						4	5						4	6						4	5							
01						4	3						5	3						4	6							
02						4	3						4	6						3	6							
03						3	6						14	6						3	5							
04						4	5						12	6						1	6							
05						4	6						15	6						4	5							
06	030	FK	93	58	56	4	7	070		58	50	36	12	5	015	FHK	80	56	50	4	6							
07	030	FK	93	59	57	4	5	060	H	66	51	40	6	6	040	HK	69	56	46	3	8							
08	020	HK	93	60	58	2	6	050	H	57	55	40	12	5	040	HK	62	60	47	3	5							
09	020	HF	75	65	57	4	6	040	HK	46	60	39	7	3	040	HK	63	62	49	4	5							
10	030	HK	68	68	57	6	6	040	HK	48	67	41	6	5	060	HK	63	65	52	5	8							
11	040	HK	65	69	57	7	7	050	HK	42	69	45	6	12	070		61	68	54	7	7							
12	050	HK	63	70	57	9	7	040	HK	51	70	52	6	12	080		59	69	54	8	11							
13	070		61	71	57	11	[illegible]	040	HK	55	71	54	8	14	100		59	[illegible]	55	8	12							
14	080		70	68	59	11	10	040	HK	57	73	54	8	[illegible]	100		63	68	55	8	11							
15	090		[illegible]	68	59	12	12	[illegible]	HK	59	71	56	8	[illegible]	100		65	66	56	8	9							
16	080		76	66	59	11	12	050	HK	70	68	58	8	[illegible]	100		70	64	54	8	6							
17	080		78	65	58	11	6	050	HK	78	65	58	8	[illegible]	100		68	64	53	8	[illegible]							
18	100		81	64	58	8	5	050	HK	81	64	58	8	7	080		70	63	53	8	8							
19	100		78	64	57	7	3	090	FK	84	63	58	7	8	080		70	63	53	7	6							
20						7	6						4	9						6	8							
21						5	4						5	12						7	8							
22						5	5						5	12						7	8							
23							1						5	12						7	9							
99	987	002	030	61	72	221	062	040	090	040	42	73	636	060	080	121	040	59	70	224	065							

DAILY WEATHER DATA

Year 1973 Month Nov. Day 02

	L.A. International Airport							Burbank							Long Beach													
	V	Wx	RH	T	DP	CD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff
	00		76	74	75	85	84	00		76	74	75	86	84	00		76	74	75	85	84	00		76	74	75	86	84
00						7	8						7	14						7	9							
01						8	5						7	12						7	7							
02						9	3						7	12						6	6							
03						12	6						7	10						6	6							
04						12	5						5	9						7	1							
05						14	3						6	12						9	3							
06	100		87	60	56	14	2	070		84	59	54	7	13	070		77	58	51	8	3							
07	120		87	60	56	11	3	070		84	60	55	6	12	070		75	59	51	2	1							
08	120		84	61	56	9	5	070		81	61	55	5	12	070		69	62	52	2	1							
09	120		76	62	55	11	5	050	H	78	61	54	7	12	080		67	63	52	8	5							
10	120		75	64	56	12	7	050	H	75	62	54	8	9	100		58	66	51	8	10							
11	120		70	65	55	12	9	050	H	70	65	55	8	9	120		58	65	50	8	9							
12	120		70	65	55	12	10	050	H	65	66	54	8	12	150		56	66	50	8	14							
13	120		68	66	55	11	8	050	H	61	67	53	8	14	150		54	67	50	8	13							
14	150		68	66	55	11	9	070		60	66	52	8	14	150		56	65	49	8	12							
15	150		63	67	54	11	9	070		63	66	53	8	14	150		58	64	49	7	9							
16	120		70	64	54	11	9	100		65	65	53	8	14	150		63	64	51	8	12							
17	100		75	62	54	12	8	100		75	61	53	8	13	120		64	62	50	7	7							
18	120		81	60	54	12	8	070		78	60	53	8	7	120		64	61	49	9	6							
19	120		84	60	55	11	6	100		77	59	52	8	9	100		67	61	50	7	7							
20						12	7						8	6						8	9							
21						11	6						8	10						8	8							
22						11	5						8	12						4	6							
23						11	3						6	9						6	6							
99	987	000	120	63	68	765	052	070	140	050	60	67	433	112	100	100	070	54	67	411	048							

T0033

DAILY WEATHER DATA Year 1973 Month Nov. Day 05

	L.A. International Airport							Burbank							Long Beach													
	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff	V	Wx	RH	T	DP	DD	ff
	80		75	74	75	65	64	80		75	74	75	65	64	80		76	74	75	66	64	80		76	74	75	66	64
00							1						14	7						3	1							
01						3	2													3	1							
02						3	2													3	3							
03						4	5													3	5							
04						5	3													4	1							
05						3	3						15	5						4	1							
06	100		71	50	41	5	3								040	HK	70	46	37	4	1							
07	100		74	50	42	4	2								040	HK	68	46	36	14	3							
08	100		61	55	42	4	3	250		90	51	48	12	6	040	HK	59	53	39	13	5							
09	050	HK	49	61	42	3	5	150		39	60	35	12	5	040	HK	49	58	39	14	3							
10	050	HK	45	65	43	11	5	100		35	64	36	12	6	050	HK	44	63	41	14	6							
11	100		45	66	44	11	8	100		37	66	39	7	7	060	HK	38	67	41	13	1							
12	080		45	67	45	12	9	070		38	68	40	8	12	070		42	68	44	9	10							
13	080		48	67	46	12	12	070		28	71	37	7	13	070		44	68	45	8	14							
14	140		53	66	48	13	10	070		28	71	37	8	12	080		41	69	44	11	11							
15	200		50	66	47	11	12	150		[illegible]	[illegible]	41	8	12	100		41	67	44	12	5							
16	200		56	64	48	12	13	150		31	69	37	8	11	100		43	67	43	13	11							
17	300		64	62	50	12	8	150		25	64	36	8	9	120		50	67	42	13	11							
18	140		67	59	48	12	9	150		41	62	38	6	9	140		58	60	45	12	8							
19	140		67	60	49	10	3	150		40	60	39	1	3	140		56	59	43	11	3							
20						10	3						14	3						4	1							
21						2	2						14	5						4	1							
22						1	2						14	5						6	1							
23						3	3						16	5						14	1							
99	050	090	050	45	67	322	043	070	120	070	28	71	--6	-	040	080	040	38	71	277	032							

DAILY WEATHER DATA

Year 1973 Month Nov. Day06

	L.A. International Airport								Burbank								Long Beach															
	V	Wx	RH	T	DP	DD	ff		V	Wx	RH	T	DP	DD	ff		V	Wx	RH	T	DP	DD	ff		V	Wx	RH	T	DP	DD	ff	
	60		76	74	75	06	84		60		76	74	75	06	[illegible]		60		76	74	75	06	04		60		76	74	75	86	04	
00						4	5							16	6							5	1									
01						3	5							12	5							8	1									
02						5	2															9	1									
03						3	3							6	6							13	3									
04						15	2							14	5							8	1									
05						6	2							14	6							14	6									
06	140		71	51	42	7	2		200		65	44	33	12	5		150		65	46	35	13	1									
07	100		71	50	41	4	2		200		65	45	34	13	5		040	HK	65	46	35	16	3									
08	080		59	56	42	5	3		150		48	52	33	8	5		040	HK	54	52	36	6	3									
09	080		51	60	42	7	2		100		50	61	33	13	5		040	HK	45	57	36	1	3									
10	060	HK	41	65	41	2	3		100		32	66	35	9	6		030	HK	39	62	37	15	3									
11	060	HK	36	69	41	10	3		100		31	69	37	10	3		040	HK	35	67	38	16	3									
12	060	HK	42	69	45	11	9		100		24	72	33	8	6		040	HK	35	71	42	8	7									
13	100		49	68	48	11	12		040	HK	27	73	37	8	7		060	HK	41	70	45	8	12									
14	100		54	67	50	11	10		040	HK	29	74	40	8	12		120		38	70	43	9	8									
15	140		51	67	48	11	9		030	HK	34	73	43	7	9		150		41	70	45	12	12									
16	140		51	67	48	11	9		040	HK	34	70	40	8	9		150		42	68	44	13	7									
17	140		60	64	50	12	8		080		34	65	36	8	12		150		56	64	48	13	9									
18	140		69	61	51	11	8		070		34	64	35	5	7		140		67	62	51	14	9									
19	140		78	61	54	12	6		070		39	62	37	10	3		140		69	61	51	14	7									
20						10	3							14	3							14	5									
21						8	2							7	3							10	3									
22						9	2							4	5							1	5									
23						13	3							4	5							6	5									
	[illegible]	[illegible]	[illegible]	[illegible]	T MAX	[illegible]	ff 6-12		[illegible]	[illegible]	[illegible]	[illegible]	T MAX	[illegible]	ff 6-12		[illegible]	[illegible]	[illegible]	[illegible]	T MAX	[illegible]	ff 6-12									
99	060	100	060	36	70	423	025		030	150	030	24	74	674	048		030	100	030	35	72	783	027									

700333

DAILY WEATHER DATA

Year 1973 Month Nov. Day 07

L.A. International Airport

	V	Wx	RH	T	DP	DD	ff
	80		76	74	75	86	84
00						4	5
01						4	3
02						4	3
03						5	2
04						4	3
05						5	3
06	060	HK	80	54	48	7	3
07	060	HK	30	54	48	4	3
08	060	HK	69	58	48	5	3
09	030	HK	56	[illegible]	47	6	5
10	030	HK	51	67	48	7	3
11	025	HK	49	70	50	12	3
12	030	HK	55	70	53	11	8
13	040	HK	61	70	56	12	8
14	050	HK	65	69	57	11	7
15	050	HK	68	69	58	11	8
16	07		76	66	58	11	10
17	070		94	64	59	11	9
18	050	HK	57	63	59	12	8
19	030	FHK	90	62	59	11	7
20						12	5
21						10	3
22						7	3
23						8	2
99	025	111	025	49	72	423	033

Burbank

	V	Wx	RH	T	DP	DD	ff
	80		76	74	75	86	84
00						10	3
01						14	3
02						10	3
03						10	3
04						10	3
05						10	3
06	070		68	52	42	10	3
07	100		68	52	42	7	5
08	070		58	59	44	7	6
09	040	H	56	65	49	7	9
10	030	HK	42	68	44	7	9
11	030	HK	37	72	44	7	8
12	030	HK	33	74	43	6	9
13	020	HK	36	75	46	8	7
14	025	HK	32	78	46	7	9
15	025	HK	43	76	52	8	9
16	030	HK	43	76	52	8	6
17	030	HK	51	70	51	8	9
18	050	HK	54	67	50	8	8
19	050	HK	70	64	54	11	3
20						1	3
21						13	3
22						4	2
23						4	3
99	020	133	020	32	78	544	067

Long Beach

	V	Wx	RH	T	DP	DD	ff
	80		76	74	75	86	84
00						6	3
01						16	3
02						16	3
03						12	3
04						10	1
05						9	3
06	050	HK	68	50	40	6	1
07	040	HK	64	52	40	4	1
08	030	HK	59	55	41	1	1
09	040	HK	64	59	47	7	1
10	050	HK	63	64	51	4	5
11	070		58	67	52	6	3
12	070		56	68	52	8	9
13	100		53	70	52	8	7
14	100		51	70	51	7	7
15	100		61	67	53	8	10
16	100		65	66	54	8	9
17	120		70	64	54	9	6
18	080		70	63	53	14	9
19	050	HK	73	62	53	14	6
20						16	5
21						1	2
22						5	1
23						3	3
99	030	080	030	51	71	321	020

	V	Wx	RH	T	DP	DD	ff
	80		76	74	75	86	84

APPENDIX C

LARPP PROGRAM LAUNCH SITE DATA

	Lvl	Ht.(m)	MB	T°C	RH
10/1/73 - 0713 PDT	Sfc-1	0	1012.6	15.6	74
	2	450	960	12.5	90
Imperial Rd. &	3	840	916	9.6	34
Old School House Rd.	4	1390	859	15.2	12
Downey, CA	5	2150	784	12.8	10
	6	3100	700	6.6	12
10/2/73 - 1310 PDT	Sfc-1	0	988	19.9	44
	2	740	903	11.9	76
Holt St. & SR #71	3	930	883	12.4	63
Pomona, CA	4	1100	886	15.5	20
	5	1400	834	15.1	13
	6	1870	787	13.0	13
	7	2100	765	11.4	13
10/4/73 - 0750 PDT	Sfc-1	0	1005.2	15.7	73
	2	40	1002	14.8	73
Alameda & 7th St.	3	400	960	17.0	43
L.A., CA	4	420	958	22.3	19
	5	600	939	23.4	10
	6	1310	862	19.6	10
	7	2270	772	11.7	10
	8	2880	719	5.7	10
	9	3200	693	4.5	10
	10	3500	670	6.2	10
	11	3520	658	6.1	10

	Lvl	Ht.(m)	MB	T°C	RH
10/5/73 - 0700 PDT	Sfc-1	0	1008	11.6	90
	2	320	968	7.7	92
Los Amigos Hosp. &	3	380	963	9.4	63
Imperial Rd.					
Downey, CA					

Signal knocked out by interference.

10/10/73 - 0708 PDT	Sfc-1	0		14.0	85
	2	400		10.6	84
Los Amigos Hosp.	3	450		13.6	75
Downey, CA					

Radio signal blocked out, ascent terminated.

10/11/73 - 0640 PDT	Sfc-1	0		12.5	55
	2	210		15.2	47
Alameda & 7th St.	3	390		15.2	42
L.A., CA	4	780		13.8	44
	5	820		12.6	43
	6	1570		11.1	30
	7	1920		6 8	32
	8	2550		2.7	20
	9	3080		1.5	18

	Lvl	Ht.(m)	MB	T°C	RH
10/12/73 - 0740 PDT	Sfc-1	0	1003.8	15.0	60
	2	50	997	14.8	48
Alameda & 7th St.	3	170	987	16.8	43
L.A., CA	4	490	950	17.8	40
	5	970	896	16.5	18
10/15/73 - 0637 PDT	Sfc-1	0		13.0	100
	2	230		10.6	93
Los Amigos Hosp. &	3	330		15.2	17
Imperial Rd.	4	360		20.5	13
L.A., CA	5	480		22.7	8
	6	1470		19.3	8
	7	3170		7.5	5
10/16/73 - 0737 PDT	Sfc-1	0		14.9	90
	2	150		19.3	43
Alameda & 7th St.	3	360		23.9	25
L.A., CA	4	600		25.0	19
	5	1450		19.3	18
	6	3100		6.8	21

	Lvl	Ht.(m)	T°C	RH
10/17/73 - 0740 PDT	Sfc-1	0	17.9	43
	2	100	22.0	33
Alameda & 7th St.	3	420	25.3	18
L.A., CA	4	1210	20.4	18
	5	2200	9.5	35
	6	3050	6.3	16
Second Ascent - 1119 PDT	Sfc-1	0	27.5	36
	2	100	24.6	31
Alameda & 7th St.	3	300	27.0	18
L.A., CA	4	850	25.3	20
10/18/73 - 0718 PDT	Sfc-1	0	18.0	82
	2	100	19.1	62
Los Amigos Hosp.				
Downey, CA				
10/23/73 - 0800 PDT	Sfc-1	0	16.5	94
	2	150	15.7	93
Los Amigos Hosp.	3	320	14.2	92
Downey, CA	4	1170	9.5	91
	5	1310	6.9	70
	6	1320		
	7	1400	9.3	20
	8	1640	8.4	30
	9	2200	4.9	88
	10	2410	3.7	77
	11	2550	5.2	13
	12	2560		
	13	3110	4.8	8

	Lvl	Ht.(m)	T°C	RH
10/24/73 - 0726 PDT	Sfc-1	0	11.3	90
	2	170	14.4	75
Los Amigos Hosp.	3	390	12.7	63
Downey, CA	4	520	11.5	77
			*	
	5	1250	14.5	24
	6	1500	14.5	20
10/25/73 - 0641 PDT	Sfc-1	0	12.8	88
	2	120	14.4	93
Alameda & 7th St.	3	280	14.4	89
L.A., CA	4	310	14.6	60
	5	380	16.4	55
	6	800	17.4	22
	7	1400	14.6	20
	8	1980	11.8	16
Second Sound - 1023 PDT	Sfc-1	0	21.5	54
	2	120	18.1	47
Alameda & 7th St.	3	missing	data	
L.A., CA	4	490	18.1	26
	5	1000	17.6	17
	6	1420	14.8	17
10/26/73 - 0747 PDT	Sfc-1	0	13.6	93
	2	110	12.4	86
Alameda & 7th St.	3	200	15.3	65
L.A., CA	4	370	17.0	48
	5	750	17.0	33
	6	1400	14.1	14
	7	2160	12.7	13
	8	3050	7.0	17

* Missing data between these two figures.

	Lvl	Ht.(m)	T°C	RH
10/27/73 - 0701 PDT	Sfc-1	0	14.0	64
	2	90	21.8	25
Alameda & 7th St.	3	450	23.5	18
L.A., CA	4	570	24.5	17
	5	1440	17.0	17
	6	1970	14.7	16
	7	2540	9.3	17
	8	3080	8.9	14
10/28/73 - 0848 PST	Sfc-1	0	25.0	19
	2	160	23.5	16
Los Amigos Hosp.	3	240	26.3	15
Downey, CA	4	630	25.1	16
	5	1550	19.7	15
	6	3180	8.1	14
10/29/73 - 0618 PST	Sfc-1	0	10.7	59
	2	170	18.4	20
Los Amigos Hosp.	3	370	21.5	15
Downey, CA	4	780	22.5	13
	5	1510	18.3	12
	6	2600	13.0	11
	7	3150	8.7	10

	Lvl	Ht.(m)	T°C	RH
10/30/73 - 0617 PST	Sfc-1	0	13.0	50
	2	80	22.5	30
Los Amigos Hosp.	3	570	19.8	13
Downey, CA	4	1050	19.3	12
	5	1250	18.4	13
	6	2230	12.1	12
	7	3150	6.0	13
11/1/73 - 0530 PST	Sfc-1	0	13.8	93
	2	260	13.0	86
Alameda & 7th St.	3	300		
L.A., CA	4	330	13.5	54
	5	510	13.5	39
	6	600		
	7	610	15.8	17
	8	1200		
	9	1230	16.7	13
	10	3000	7.9	9
11/2/73 - 0825 PST	Sfc-1	0	17.2	76
	2	290	13.1	92
Los Amigos Hosp.	3	980	8.5	92
Downey, CA	4	1400	7.3	84
	5	1550	8.5	30

	Lvl	Ht.(m)	T°C	RH
11/5/73 - 0525 PST	Sfc-1	0	6.8	92
	2	80	11.0	82
Los Amigos Hosp.	3	400	12.1	50
Downey, CA	4	1050	11.7	15
	5	1530	10.3	12
	6	3120	4.2	21
11/6/73 - 0544 PST	Sfc-1	0	10.0	62
	2	70	12.9	49
Alameda & 7th St.	3	630	13.5	17
L.A., CA	4	740	15.6	15
	5	1970	11.7	17
	6	2970	7.5	17
	7	3070	7.1	41
11/7/73 - 0636 PST	Sfc-1	0	13.3	57
	2	150	13.6	54
Alameda & 7th St.	3	400	16.3	40
L.A., CA	4	670	16.3	48
	5	1500	16.1	39
	6	2950	8.2	36

APPENDIX D

RADIOSONDE DATA SUMMARY

LOS ANGELES INTERNATIONAL AIRPORT STATION

NOTE: Units used by Air Pollution Control District

Pressure - Millibars
Temperature - Deg. Cent.
Dew Point - Deb. Cent.
Height - Feet MSL

RADIOSONDE DATA SUMMARY

STATION: Los Angeles International Airport

DATE: 1973 Oct 1				DATE: 1973 Oct 2				DATE: 1973 Oct 3				DATE: 1973 Oct 4				DATE: 1973 Oct 5			
TIME: 0538P				TIME: 0539P				TIME: 0540P				TIME: 0533P				TIME: 0532			
PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT
1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	[illegible]	35-36	37-38	39-40	41-44	45-48	49-52	53-56	[illegible]	[illegible]	65-68	69-72
1012	16.7	12.5	110	1013	16.9	12.7	110	1013	15.7	11.7	110	1010	14.3	11.9	110	1007	15.6	14.7	110
1000	15.7	12.1	430	1000	16.1	11.0	460	1000	15.1	11.5	460	1000	14.3	14.0	380	1000	14.8	14.5	310
948	12.3	11.7	1870	957	12.4	11.1	1640	959	11.9	11.5	1640	978	15.1	11.3	980	966	12.7	12.7	1280
921	10.6	10.6	2690	906	9.0	8.9	3180	923	9.3	8.9	2660	958	17.4	6.3	1570	953	13.4	10.8	1640
909	9.1	-	3050	895	7.2	-	3510	912	8.5	-5.4	2990	931	23.6	-	2390	946	13.8	-	1840
898	14.7	-	3410	875	14.6	-	4130	897	8.6	-	3440	850	18.0	-	4960	934	20.0	-	2200
893	15.9	-	3580	862	14.2	-	4560	890	12.0	-	3670					914	21.4	-	2850
861	16.5	-	4590	850	15.3	-	4930	884	13.2	-	3840					895	21.4	-	3380
850	16.1	-	4930					875	12.6	-	4130					850	18.0	-	4880
								857 850	15.5 15.3	- -	4690 4930								
TIME: 1130P				TIME: 1130P				TIME: 1130P				TIME: 1130P				TIME:			
1012	20.1	12.4	110	1014	20.2	10.6	110	1013	19.4	11.2	110	1010	19.4	14.2	110	1008	20.1	14.0	110
1000	17.3	11.5	460	1000	17.2	9.4	490	1000	17.4	10.7	470	1000	17.6	13.5	380	1000	17.8	12.9	340
954	12.8	11.5	1770	912	9.9	9.3	3050	952	12.9	9.4	1800	981	16.1	13.0	920	936	14.2	11.7	2200
936	12.2	11.5	2300	908	12.2	2.4	3180	920	12.1	7.5	2490	969	17.4	11.9	1280	930	18.2	2.5	2360
921	11.9	10.3	2790	903	12.9	-0.4	3350	913	14.0	2.2	3020	959	25.4	-	1570	888	20.1	-	3670
916	11.9	7.0	2920	897	14.6	-0.7	3540	906	18.4	-	3250	951	25.7	-	1800	850	17.8	-4.9	4910
911	18.1	-4.6	3050	850	15.0	-7.8	5000	850	15.9	-	5000	850	19.0	-	4990				
850	16.5	-	4980																

RADIOSONDE DATA SUMMARY

STATION Los Angeles International Airport

DATE 1973 Oct. 7				DATE 1973 Oct 8				DATE 1973 Oct 9				DATE 1973 Oct. 10				DATE 1973 Oct. 11			
TIME 0542 P				TIME 0531 P				TIME 0540 P				TIME 0542 P				TIME			
PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT
[illegible]	5-8	9-12	13-16	[illegible]	21-24	25-28	29-32	33-34	35-36	37-38	39-40	41-44	45-48	49-52	53-56	[illegible]	61-64	65-68	69-72
1011	16.4	9.5	110	1009	13.9	13.1	110	1008	13.4	10.4	110	1010	13.6	10.0	110	1007	13.4	5.2	110
1000	15.6	8.8	420	1000	12.7	12.1	360	1000	13.7	10.2	340	1000	13.8	13.1	370	1000	14.6	3.2	330
931	10.0	8.0	2390	965	11.0	10.4	1310	991	14.2	11.5	620	976	14.0	12.0	1050	988	15.1	4.5	660
850	3.8	3.8	4860	864	8.4	7.5	4330	944	11.4	11.4	1940	962	14.4	5.8	1440	980	14.4	4.4	850
				850	6.9	6.2	4800	920	11.4	7.2	2620	941	15.0	-	2070	958	15.1	2.9	1480
								850	6.6	2.6	4800	923	14.6	-	2590	891	14.0	-5.2	3540
												869	10.7	-	4270	850	10.8	-6.0	4810
												850	9.4	-	4860				
TIME 1140 P				TIME 1100 P				TIME 1140 P				TIME 1140 P				TIME			
1012	19.3	[illegible]	110	[illegible]	17.6	[illegible]	110	1005	[illegible]	[illegible]	110	1010	21.7	7.2	110	1007	21.7	10.2	110
1000	[illegible]	[illegible]	440	1000	16.6	12.5	370	1000	[illegible]	[illegible]	340	1000	18.9	7.2	380	1000	18.6	5.8	310
[illegible]	[illegible]	[illegible]	2000	[illegible]	[illegible]	[illegible]	1940	975	[illegible]	[illegible]	[illegible]	984	18.5	2.6	850	963	17.8	-0.9	1380
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	20.9	[illegible]	[illegible]	950	17.0	-2.6	1740
[illegible]	[illegible]	[illegible]	[illegible]					[illegible]	[illegible]	[illegible]	[illegible]	870	[illegible]	[illegible]	[illegible]	899	[illegible]	-	3610
[illegible]	4.8	[illegible]	[illegible]					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	850	12.1	-	4840
								[illegible]	10.0	[illegible]	[illegible]								
								850	8.4	0.4	[illegible]								

RADIOSONDE DATA SUMMARY

STATION Los Angeles International Airport

DATE: 1973 Oct. 12				DATE: 1973 Oct. 13				DATE:				DATE:				DATE:			
TIME: 0538 P				TIME: 0534 P				TIME:				TIME:				TIME:			
PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT
1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-34	35-36	37-38	39-40	41-44	45-48	49-52	53-56	57-60	61-64	65-68	69-72
1008	13.4	11.3	110	1010	16.0	12.4	110												
1000	15.4	12.2	330	1000	17.0	12.5	390												
984	15.5	11.1	750	982	21.5	0.1	890												
971	15.4	10.1	1150	941	22.9	30.0	2100												
957	17.1	1.9	1540	914	22.4	30.0	2920												
939	17.8	-3.0	2070	850	18.1	30.0	5000												
895	16.8	-	3410																
850	13.9	-	4870																
TIME: 1120 P				TIME: 1130 P				TIME:				TIME:				TIME:			
1009	21.2	14.1	110	1011	22.8	10.0	110												
1000	18.6	11.9	370	1004	21.4	9.0	330												
978	18.5	9.0	980	1000	21.4	7.3	430												
963	17.8	8.1	1410	996	21.4	5.7	560												
955	18.6	-1.3	1640	982	26.3	-	950												
931	19.1	-3.1	2360	970	26.8	-	1310												
850	15.5	-	4920	930	25.5	-	2490												
				850	19.1	-	5070												

RADIOSONDE DATA SUMMARY

Los Angeles International
Airport

1973 October 14				1973 Oct. 15				1973 Oct. 16				1973 Oct 17				1973 Oct 18			
0530 P				0532 P				0540 P				0538 P				0546 P			
1010	16.1	15.3	110	1012	13.4	13.0	110	1011	14.3	14.3	110	1012	11.6	11.6	110	1013	17.5	13.6	110
1000	16.9	16.5	400	1000	12.9	12.2	450	1000	13.8	13.8	410	1003	10.9	10.5	360	1006	19.2	8.8	330
984	22.0	15.5	850	988	12.7	7.2	750	990	13.4	9.2	690	1000	12.7	10.7	440	1000	24.0	2.2	470
972	24.9	-	1180	976	13.2	-5.9	1080	975	22.2	-	1120	992	21.9	17.4	660	974	25.7		1250
935	25.3	-	2300	970	13.6	-	1280	941	24.8	-	2130	976	25.4	-	1120	912	24.0		3150
850	19.0	-	5030	965	21.8	-	1410	917	24.5	-	2850	961	25.8	-	1570	861	22.4		4760
				956	23.1	-	1610	850	19.6	-	5030	889	22.1	-	3810	850	19.5	2.0	5100
				947	24.3	-	1970					850	19.1	-	5090				

1130 P				1130 P				1139 P				1145 P				1130 P			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10.7	11.8	110	1014	[illegible]	10.9	110
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	300
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	24.0	5.4	510
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	[illegible]	[illegible]	[illegible]	-	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
				[illegible]	[illegible]	-	[illegible]	[illegible]	[illegible]	-	[illegible]								
				[illegible]	[illegible]	-	[illegible]												

RADIOSONDE DATA SUMMARY

STATION Los Angeles International Airport

DATE 1973 Oct. 19				DATE 1973 Oct. 20			
TIME 0533 P				TIME 0530 P			
PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT
					21-24	25-28	29-32
1011	17.2	12.5	110	1011	15.0	13.4	110
1000	19.6	2.9	430	1000	13.0	12.7	400
986	23.6	1.3	850	987	12.2	10.9	750
976	25.5	-	1120	966	13.6	9.8	1350
940	25.8	-	2200	952	18.2	8.2	1740
874	20.6	-2.5	4270	940	19.1	-	2170
850	18.3	-3.2	5060	912	18.0	-	2990
				866	14.6	-	4430
				850	13.0	11.6	4930
TIME 1130 P				TIME 1131 P			
1012	29.5	5.6	110	1012	19.6	12.3	110
1000	27.9	2.9	440	1007	16.7	11.2	230
971	25.8	2.5	1280	1000	15.7	11.5	430
921	25.0	1.1	2790	984	15.1	9.7	890
850	19.1	-0.8	5100	951	18.4	2.6	1840
				940	18.2	0.3	2170
				922	17.3	11.5	2690
				910	15.5	12.9	3050
				850	14.3	-2.6	4970

RADIOSONDE DATA SUMMARY

STATION Los Angeles International Airport

DATE 1973 Oct.21				DATE 1973 Oct.22				DATE 1973 Oct.23				DATE 1973 Oct.24				DATE 1973 Oct. 25			
TIME 0530				TIME 0530				TIME 0539				TIME 0532				TIME 0535			
PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT	PRES	TEMP	DEW PT	HEIGHT
1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-34	35-36	37-38	39-40	41-44	45-48	49-52	53-56	57-60	61-64	65-68	69-72
1012	15.5	14.4	110	1012	16.1	13.4	110	1016	16.7	16.0	110	1012	12.9	10.1	110	1009	13.9	12.0	110
1000	13.2	12.9	430	1000	14.9	13.1	440	1000	14.5	13.9	550	1000	12.5	9.1	430	1000	15.3	14.0	360
980	13.0	12.7	1020	928	11.0	10.5	2490	967	13.1	12.4	1440	940	12.3	-2.7	2170	963	16.9	8.8	1410
947	11.8	11.5	1940	922	10.7	5.0	2660	875	8.0	7.2	4230	921	11.4	7.3	2720	951	16.9	4.5	1740
940	12.6	12.3	2170	904	11.0	-5.0	3220	860	8.5	-2.5	4690	905	11.8	0.6	3220	943	17.7	-	2000
919	12.2	11.9	2760	895	10.0	-8.6	3480	850	8.5	-3.0	5000	886	14.7	0.5	3810	931	18.7	-	2330
908	11.9	10.8	3080	867	12.2	-	4360					868	13.7	-1.9	4360	905	18.1	-	3150
894	11.6	3.6	3510	850	12.6	-	4900					850	14.0	-2.5	4900	895	19.3	-	3440
886	13.5	7.7	3810													850	15.9	-	4910
861	11.8	-	4530																
850	11.0	-	4900																
TIME 1130				TIME 1130				TIME 1130				TIME 1130				TIME 1130			
1012	18.1	14.8	110	1015	17.2	13.3	110	1017	18.4	14.9	110	1011	20.2	10.6	110	1010	20.4	15.0	110
1000	15.8	13.8	450	1000	14.8	12.4	520	1000	14.3	14.3	570	1000	13.9	5.3	420	1000	18.0	14.3	380
979	14.8	14.2	1050	971	12.9	12.2	1350	922	11.5	11.3	2820	995	12.7	4.4	560	993	17.4	14.1	590
941	12.1	11.9	2170	876	8.6	8.3	4170	881	10.2	5.0	4070	948	16.6	-	1940	985	18.6	12.3	790
932	12.8	10.0	2390	863	6.5	-	4590	867	9.4	6.5	4490	924	16.1	-	2690	968	18.0	9.4	1280
909	11.4	4.8	3120	854	8.8	-	4860	850	8.2	6.4	5040	850	12.1	-10.2	4970	955	19.2	2.2	1640
893	11.0	-	3610	850	9.0	-	4970									942	19.9	0.3	2030
850	11.4	-3.1	4930													850	15.8		4940

Reproduced from best available copy.

RADIOSONDE DATA SUMMARY

Los Angeles International Airport

1973 Oct. 26				1973 Oct. 27			
0539 P				0548 P			
1010	14.6	13.3	110	1012	13.3	11.4	110
1000	14.5	12.6	380	1000	21.4	1.6	450
986	14.5	13.1	750	987	24.3	-	820
973	13.8	12.7	1150	960	25.2	-	1640
960	15.9	9.7	1540	924	23.7	-	2760
939	17.6	1.6	2170	850	18.1	-	5070
921	18.0	-4.7	2690				
850	15.4	-	4920				
1130				1135			
1010	20.4	13.6	110	1013	30.1	10.6	110
1005	18.8	12.6	230	1000	28.4	5.3	480
1000	18.5	12.0	400	905	23.3	-	3310
981	18.1	11.4	950	850	18.6	-	5120
967	20.5	6.9	1350				
920	19.4	-2.9	2760				
901	20.0	-	3380				
850	16.4	-6.0	4980				

RADIOSONDE DATA SUMMARY

Los Angeles International
Airport

1973 Oct. 28				1973 Oct.29				1973 Oct. 30				1973 Oct.31				1973 Nov. 1			
0550				0534				0551				0550				0540			
1012	15.7	-2.3	110	1010	13.7	4.2	110	1013	15.6	4.6	110	1011	15.1	0.4	110	1007	14.8	13.4	110
1000	25.8	-	460	1000	17.9	7.1	380	1000	21.6	-1.7	480	1006	15.2	-4.1	230	1000	13.8	13.4	310
978	25.2	-	1050	991	22.0	1.0	660	979	22.0	-	1050	1000	19.5	-	420	965	12.5	12.5	1280
943	26.4	-	2100	976	21.1	-	1080	917	19.9	-	2920	986	22.5	-	820	955	11.0	6.1	1570
887	22.4	-	3870	937	22.7	-	2260	850	17.0	-	5070	965	22.8	-	1410	945	16.5	-	1870
850	20.0	-	5100	850	18.7	-	4980					930	21.0	-	2490	930	17.0	-	2300
												905	20.8	-	3000	850	16.5	-	4820
												875	19.2	-	4230				
												850	18.5	-	5030				
1130				1130				1212				1130				1220			
1013	29.7	-0.6	110	1011	27.1	4.2	110	1014	28.7	-7.3	110	1011	23.2	11.0	110	1007	21.2	14.1	110
1000	28.7	-	490	1000	23.6	2.5	430	1000	26.1	-	510	1003	20.0	11.0	360	1000	19.5	12.0	310
903	22.9	-	3410	971	21.4	-	1250	918	21.3	-	2350	1000	21.1	11.1	430	942	13.9	12.7	1640
850	20.5	-	5130	941	22.4	-	2120	850	17.6	-	5120	978	23.0	0.1	1280	930	13.5	9.2	2300
				912	20.7	-	3050					966	22.5	-1.0	1410	915	14.4	-4.9	2790
				850	18.6	-	5030					948	23.6	-	1970	868	15.7	-5.4	4230
												850	18.9	-	5040	850	17.5	-	4840

RADIOSONDE DATA SUMMARY

Los Angeles International Airport

1973 Nov. 2				1973 Nov. 3			
0530 PST				0530 PST			
1010	16.1	12.9	110	1014	14.6	10.2	110
1000	15.4	12.7	400	1000	13.4	9.2	510
970	13.5	13.5	1120	953	10.0	9.4	1840
850	5.0	4.7	4840	861	3.5	0.0	4590
				850	4.1	-10.8	4910
1130 PST				1130 PST			
1012	18.5	12.0	110	1015	19.3	5.0	110
1000	15.5	10.2	460	1000	16.0	5.1	540
942	11.2	10.9	2130	937	11.6	7.0	2300
850	6.3	3.8	4910	863	4.0	9.9	4590
				850	7.1	3.9	4980

RADIOSONDE DATA SUMMARY

Los Angeles International
Airport

1973 Nov. 4				1973 Nov. 5				1973 Nov. 6				1973 Nov. 7				1973 Nov. 8			
0530 P				0530 P				0628 P				0548 P				0605 P			
1015	11.7	3.5	110	1016	11.2	5.5	110	1017	11.0	4.5	110	1015	13.1	7.6	110	1014	15.6	14.1	110
1005	12.4	2.0	430	1000	12.6	6.4	550	1013	11.0	1.8	230	1010	13.5	7.6	200	1000	14.7	14.2	490
1000	11.6	3.4	530	984	12.7	4.8	980	1000	13.1	8.4	570	1000	15.6	4.0	520	970	12.7	5.6	1350
984	11.0	3.3	950	927	10.9	2.7	2660	991	12.4	7.7	820	773	16.6	-1.6	1250	965	16.3	7.5	1480
942	8.3	7.8	2130	905	11.6	-	3310	984	12.8	6.4	980	946	19.5	3.7	2030	955	17.5	1.4	1770
912	6.6	-0.4	3020	850	11.6	-	5010	977	13.2	0.5	1210	885	17.3	5.2	3940	912	18.5		3080
892	7.4	-7.9	3610					951	13.9	-7.5	1970	850	16.8	4.5	5090	864	15.5	-6.8	4590
867	5.6	-8.0	4400					895	15.1	-	3610					850	16.3		5030
850	6.5	-	4930					850	13.4	-8.0	5070					831	18.2		5680
																700	8.4		
1130 P				1130 P				1130 P				1144 P				1141 P			
1016	19.3	3.8	110	1016	18.6	5.5	110	1017	19.7	7.8	110	1016	19.9	12.9	110	1014	19.3	13.5	110
1011	17.7	3.2	230	1008	17.0	5.9	330	1011	18.3	6.9	230	1007	17.9	12.6	330	1006	16.6	12.0	330
1000	16.8	3.5	560	1000	16.8	5.4	590	1000	16.4	6.5	580	1000	17.4	12.8	550	1000	15.7	11.9	500
947	11.3	2.5	2030	986	14.2	3.8	980	985	16.6	5.2	950	986	17.7	11.5	920	960	13.4	12.8	1640
889	6.7	1.6	3770	951	13.2	2.7	1940	972	15.8	1.5	1310	946	17.9	5.7	2130	951	16.4	10.4	1900
878	6.7	-10.5	4100	937	13.0	-3.3	2330	965	16.0	-	1540	898	19.5	7.3	3610	939	16.7	5.6	2260
868	9.0	-	4430	898	13.6	-	3510	953	16.6	-	1870	868	17.3	5.3	4560	933	18.4	6.2	2430
850	8.7	-	5000	882	12.8	-	4000	933	15.8	-	2460	850	17.0	4.3	5130	925	18.6	6.1	2690
				850	12.3	-9.5	5020	924	17.1	-	2720					882	16.6	1.5	3040
								869	15.4	-4.0	4490					850	18.6	-	5050
								850	13.9	1.2	5100								

APPENDIX E

RADIOSONDE DATA SUMMARY

EL MONTE STATION

NOTE: Units used by Air Pollution Control District

Pressure - Millibars
Temperature - Deg. Cent.
Dew Point - Deb. Cent.
Height - Feet MSL

RADIOSONDE DATA SUMMARY

El Monte

1973 Oct. 1

0538 PST

1005	16.4	12.7	302
1000	16.3	12.0	440
992	15.1	11.1	660
922	9.9	9.3	2670
916	11.2	-5.0	2820
915	14.0	-2.4	2850
911	16.1	-5.1	3020
900	16.5	-6.0	3350
879	16.5	-10.0	4000
850	15.2	-11.0	4940

1333

1004	23.5	11.2	302
1000	21.8	9.6	420
993	20.6	8.9	620
960	18.5	9.0	1570
929	15.0	7.4	2490
910	15.4	0.4	3080
907	16.8	2.0	3150
894	15.7	1.0	3540
886	16.4	-0.9	3810
880	17.0	-10.0	4040
850	16.0	-11.0	4970

1973 Oct. 2

0539 PST

1005	15.7	12.4	302
1000	16.1	11.6	450
959	12.4	11.5	1540
922	9.7	9.0	2690
893	10.0	8.9	3580
879	14.2	-0.4	4000
866	14.9	-11.0	4400
850	14.9	-11.0	4930

1330

1005	22.4	12.0	302
1000	20.6	9.5	450
993	19.1	8.5	620
971	18.1	9.1	1250
956	15.6	8.4	1640
946	15.9	9.5	1970
902	11.5	8.5	3280
890	11.2	7.9	3710
878	14.0	7.5	4070
865	15.2	-1.4	4460
850	15.0	-1.0	4960

1973 Oct. 3

0545 PST

1005	14.3	12.2	302
1000	13.8	11.7	450
993	13.8	11.7	620
952	9.9	9.3	1770
928	9.3	8.7	2490
919	9.9	5.3	2790
915	5.9	3.7	2890
909	11.3	4.0	3080
895	11.3	3.5	3510
870	12.1	-14.0	4270
861	12.1	-14.0	4560
859	13.3	-13.0	4630
850	14.0	-12.0	4910

2030

1005	20.5	11.1	302
1000	18.3	8.8	450
974	15.5	8.0	1180
925	12.0	8.3	2590
915	12.4	7.3	2920
911	13.1	2.9	3020
899	15.7	-11.0	3410
861	17.4	-10.0	4630
850	16.5	-10.0	4970

1973 Oct. 4

0542 PST

1003	9.4	8.3	302
1000	11.4	10.6	390
982	13.5	12.3	890
978	13.3	11.7	1020
954	17.3	6.2	1710
938	22.6	-5.0	2170
926	23.8	-4.0	2530
892	22.0	-6.0	3590
850	18.2	-5.2	4970

2030

1001	27.6	11.1	302
1000	26.4	9.6	340
976	24.0	9.1	1050
957	23.1	8.7	1570
951	23.0	1.3	1770
936	24.6	-3.0	2200
911	22.6	-5.0	2990
892	23.0	-5.0	3580
850	19.5	-7.0	4980

1973 Oct. 5

0540 PST

1000	13.7	13.7	302
987	12.8	12.2	660
980	15.1	12.5	820
975	12.4	11.8	1000
960	13.8	11.3	1410
956	12.5	11.8	1540
953	13.5	8.2	1620
950	14.6	6.2	1740
947	17.2	6.6	1800
935	19.5	-7.0	2170
915	21.0	-7.0	2760
891	20.4	-7.0	3510
879	20.6	-7.0	3900
850	18.1	-9.0	4900

2034

1001	22.0	12.5	302
1000	20.8	10.9	340
992	18.9	9.9	560
953	16.5	10.1	1710
934	16.2	4.2	2260
929	17.5	4.5	2430
895	19.5	-7.0	3480
877	19.2	-8.0	4070
850	17.1	-10.0	4900

RADIOSONDE DATA SUMMARY

El Monte

1973 Oct. 9				1973 Oct. 10				1973 Oct. 11				1973 Oct. 12							
0544 PST				0540 PST				0549 PST				0545 PST							
1005	11.2	8.8	302	1003	8.8	7.5	302	1001	9.0	6.1	302	1001	8.5	7.1	302				
1000	12.0	7.7	340	1000	10.2	8.0	380	1000	10.4	5.3	330	1000	12.0	8.1	330				
												988	13.4	5.3	660				
983	12.5	8.4	820	992	12.0	8.1	590	989	13.5	2.1	620	980	15.4	4.7	890				
962	11.4	9.5	1410	982	12.9	8.4	850	969	14.6	1.1	1180	964	15.9	3.0	1350				
945	11.1	9.7	1870	968	12.3	11.5	1280	956	14.5	0.7	1540	952	15.6	4.0	1710				
926	9.0	8.3	2430	955	12.0	9.2	1640	929	15.0	-1.5	2390	937	16.1	-3.0	2130				
899	7.5	6.5	3250	922	12.7	-2.6	2620	912	14.0	0.6	2850	919	16.1	-1.0	2690				
881	7.4	5.1	3770																
867	7.5	1.3	4200	899	12.1	-5.9	3280	889	12.6	-2.1	3580	905	15.1	-3.3	3120				
863	6.7	0.5	4330	850	8.0	-9.0	4840	875	13.2	-8.7	4070	878	15.1	-7.6	3970				
850	6.5	0.0	4770					850	10.9	-11.2	4820	850	13.1	-1.3	4850				
1351 PST				1312 PST				1233 PST				12 PST							
1000	22.6	7.9	302	ground				999	25.1	1.2	302								
958	17.5	6.7	1460	equipment				990	23.5	-4.0	540								
858	8.3	5.0	4560	failure				957	21.1	-2.2	1510								
850	7.4	5.8	4820					936	19.5	-1.1	2130								
								913	16.5	-1.6	2840								
								882	14.2	-2.7	3810								
								875	14.0	-7.4	4040								
								850	12.2	-14.0	4850								

RADIOSONDE DATA SUMMARY

El Monte

1973 Oct. 15				1973 Oct. 16				1973 Oct. 17				1973 Oct. 18				1973 Oct. 19			
				0530 PST				0530 PST				0530 PST				0530 PST			
PRESS	TEMP	DEW PT	HEIGHT	PRESS	TEMP	DEW PT	HEIGHT	PRESS	TEMP	DEW PT	HEIGHT	PRESS	TEMP	DEW PT	HEIGHT	PRESS	TEMP	DEW PT	HEIGHT
				1004	10.8	9.7	302	1004	12.3	9.7	302	1006	16.2	9.1	302	1005	13.8	9.5	302
ground				1000	13.1	10.6	400	1000	17.5	11.3	430	1000	20.2	10.8	480	1000	18.4	2.7	430
equipment				992	16.0	9.6	620	992	20.5	6.1	660	993	22.5	5.0	660	994	21.7	5.6	620
failure				984	20.1	7.8	850	979	23.1	3.6	1050	981	25.0	3.0	1020	986	23.5	5.4	820
(no flight)				971	22.7	1.1	1250	954	24.4	0.0	1770	953	26.2	2.1	1840	969	25.4	4.0	1310
				961	24.4	2.6	1540	928	24.6	-3.0	2560	876	21.7	-6.0	4250	938	24.6	3.3	2260
				947	25.1	3.7	1950	904	23.4	-5.0	3350	850	20.0	-7.0	5110	890	21.2	1.5	3740
				931	25.8	-3.0	2430	873	21.1	-7.0	4310					850	17.9	3.8	5050
				833 876	22.6 22.0	0.4 -1.4	3940 4130	850	18.6	-4.8	5060								
				850	19.4	-2.3	5030												
1230 PST				1345 PST				1300 PST				1300 PST				1330 PST			
1004	27.6	10.7	302	1003	28.8	10.5	302	1005	33.1	4.0	302	1005	33.3	5.0	302	1003	32.4	7.3	302
1000	27.0	9.8	420	1000	26.9	10.5	400	1000	31.6	2.0	440	1000	32.1	2.0	460	1000	31.0	6.0	400
978	24.6	8.5	1050	972	24.7	9.9	1180	985	.304	4.9	790	952	27.4	3.8	870	969	27.5	5.1	1310
966	25.1	4.8	1410	969	24.7	8.7	1310	953	27.6	2.6	1840	896	24.4	3.6	367	925	25.8	1.9	2660
962	26.4	-3.0	1540	963	26.8	3.3	1480	941	27.6	2.6	2200	850	19.9	2.3	5140	892	32.6	-0.1	3740
938	26.2	-3.0	2260	942	27.1	-2.0	2130	886	23.0	1.4	3940					850	18.4	-1.5	5060
921	25.6	-3.0	2790	911	24.7	-3.0	3080	850	19.5	-0.5	5120								
912	26.4	-3.0	3050	888	23.4	-5.0	3810												
850	20.8	-7.0	5090	856	20.5	-7.0	4860												
				850	20.5	-7.0	5060												

RADIOSONDE DATA SUMMARY

El Monte

1973 Oct 23

TIME 0539

PRES	TEMP	DEW PT	HEIGHT
1009	15.3	14.9	302
1000	15.2	14.6	540
976	13.5	12.7	1180
904	9.4	9.0	3350
850	6.9	6.3	5000

TIME 1340

PRES	TEMP	DEW PT	HEIGHT
1008	18.8	15.4	302
1000	18.1	14.2	520
978	15.8	13.0	1120
902	11.1	10.0	3380
876	9.9	8.8	4200
850	7.4	6.2	5010

1973 Oct 24

2nd release
TIME 0656

PRES	TEMP	DEW PT	HEIGHT
1005	9.5	8.5	302
1000	10.1	8.1	440
981	12.0	8.1	950
956	13.1	3.5	1640
923	12.0	7.1	3030
902	12.7	2.0	3280
874	14.5	0.0	4130
850	13.5	-3.7	4910

TIME 1340

PRES	TEMP	DEW PT	HEIGHT
1003	25.1	7.3	302
1000	23.7	7.0	380
978	21.6	7.1	1020
940	18.4	2.3	2120
934	19.3	-2.4	2300
920	19.4	-2.3	2760
907	18.6	-4.2	3150
815	18.4	-4.4	3510
888	18.0	-1.1	3740
869	17.5	-5.7	4350
850	15.9	-6.4	4960

1973 Oct 25

TIME 0543

PRES	TEMP	DEW PT	HEIGHT
1002	8.8	7.6	302
1000	11.9	10.5	360
981	15.0	8.5	920
973	15.5	8.5	1150
962	16.8	6.4	1440
951	17.0	5.3	1770
946	18.0	5.5	1900
942	18.0	4.2	2030
935	18.7	3.4	2230
927	17.9	1.0	2490
902	18.0	1.0	3250
891	17.0	-0.2	3610
858	16.0	-3.5	4660
850	15.1	-4.2	4900

TIME 1300

ground
equipment
problems

1973 Oct 26

TIME 0547

PRES	TEMP	DEW PT	HEIGHT
1003	12.7	12.7	302
1000	11.8	11.8	370
982	11.4	11.0	850
974	9.0	8.1	1120
972	8.8	-10.1	1210
962	12.5	-0.4	1440
953	13.9	4.0	1740
946	14.9	4.9	1900
938	16.4	-11.0	2130
920	17.0	-10.0	2720
889	16.4	-11.0	3670
881	15.8	-11.0	3500
850	13.6	-12.0	4870

TIME 1300

PRES	TEMP	DEW PT	HEIGHT
1002	25.4	7.2	302
1000	24.8	7.1	370
989	23.5	6.8	670
968	22.3	6.1	1280
965	22.6	-1.6	1380
936	22.6	-5.0	2730
850	17.1	-10.0	4970

RADIOSONDE DATA SUMMARY

El Monte

1973 Oct. 29				1973 Oct. 30				1973 Oct. 31				1973 Nov. 1				1973 Nov. 2			
0632				0633				0631				0633				0637			
1003	8.3	2.1	302	1007	9.6	3.1	302	1005	9.1	3.0	302	1001	10.2	9.7	302	1003	15.0	11.7	302
1000	13.7	-12.0	400	1000	15.5	-11.0	500	1000	15.0	-11.0	440	1000	10.8	9.5	330	1000	15.0	11.4	410
997	16.9	-10.0	490	974	19.9	-7.0	670	998	18.4	-9.0	490	982	13.5	9.4	820	978	13.0	11.0	1020
983	20.9	-7.0	890	967	21.1	-7.0	1440	975	21.2	-7.0	1120	948	16.5	-3.6	1770	916	9.6	8.7	2810
971	22.6	-5.0	1210	891	19.9	-7.0	3740	968	21.7	-6.0	1360	883	14.9	-4.9	3760	885	7.1	6.5	3760
949	22.6	-5.0	2000	872	19.1	-8.0	4350	961	22.8	-5.0	1560	850	15.5	-3.4	4840	865	7.0	5.9	4380
898	20.0	-7.0	3410	850	17.4	-10.0	5070	892	21.2	-7.0	3640					850	5.4	4.7	4850
882	19.7	-7.0	3940					875	19.0	-8.0	4170								
850	17.5	-9.0	4990					850	19.0	-8.0	5010								
1332				1332				1335				1330				1336			
1004	27.9	0.5	302	1006	29.8	-11.6	302	1003	30.0	-6.4	302	1000	21.0	11.4	302	1004	19.5	17.1	302
1000	26.8	-2.0	410	1000	28.4	-1.0	490	1000	27.8	-1.0	380	988	18.5	9.8	620	1000	17.5	9.0	420
990	25.5	-3.0	690	970	25.1	-3.0	1350	994	26.6	-2.0	560	953	15.4	9.3	1640	986	16.1	8.4	820
963	23.5	0.0	1480	900	19.4	-8.0	3500	950	23.9	-4.0	1840	933	14.4	2.5	2730	943	13.0	8.7	2070
936	23.2	-5.0	2300	879	20.6	-7.0	4200	933	22.2	-6.0	2360	916	15.1	-3.7	2760	900	8.6	8.2	3330
850	17.9	-9.0	5030	850	18.6	-8.0	5110	912	23.0	-5.0	3020	906	14.6	-5.7	3080	850	6.0	5.7	4880
								889	21.1	-7.0	3740	885	15.0	-7.8	3740				
								862	18.0	-9.0	4590	850	14.4	-4.9	4820				
								850	17.9	-9.0	5010								

Reproduced from
best available copy.

RADIOSONDE DATA SUMMARY

STATION El Monte

DATE 1973 Nov. 5

PRES	TEMP	DEW PT	HEIGHT
TIME 0644 PST			
1009	6.7	4.9	302
1000	9.2	3.1	540
985	11.5	3.8	980
974	12.1	0.9	1280
937	12.1	0.4	2360
915	11.1	-5.0	3020
912	10.4	-1.4	3120
901	10.4	-4.4	3410
887	12.4	-1.4	3810
850	10.5	-1.5	5000
TIME 1330 PST			
1008	20.9	6.8	302
1000	19.4	3.9	530
931	13.4	-2.5	2530
850	12.0	-1.4	5040

DATE 1973 Nov. 6

PRES	TEMP	DEW PT	HEIGHT
TIME 0636 PST			
1010	6.0	3.5	302
1000	10.4	4.1	570
978	13.1	2.9	1180
947	13.9	-5.3	2100
921	13.6	-1.2	2820
905	14.6	-1.1	3350
881	14.5	-7.6	4150
863	13.1	-7.5	4690
850	12.7	-7.0	5060
TIME 1330 PST			
1009	22.4	1.4	302
1000	20.7	1.0	560
977	18.1	0.3	1210
929	15.2	-11.0	2620
888	15.5	-5.0	3870
881	16.4	-4.3	4080
859	14.5	-6.4	4790
850	14.5	-6.4	5040

DATE 1973 Nov. 7

PRES	TEMP	DEW PT	HEIGHT
TIME 0630 PST			
1009	9.2	6.1	302
1000	11.6	3.6	540
985	14.0	4.0	980
973	15.5	2.4	1310
959	15.4	1.5	1710
946	16.2	0.4	2100
932	16.6	-3.0	2450
905	16.5	5.1	3350
897	17.1	5.0	3580
850	16.5	2.5	5080
TIME 1333 PST			
1008	24.0	4.4	302
1000	22.5	4.0	520
989	20.6	3.3	820
949	18.0	-0.3	2020
910	18.7	5.2	3220
879	17.8	5.1	4170
864	18.2	3.6	4660
850	17.0	2.6	5090

DATE 1973 Nov. 8

PRES	TEMP	DEW PT	HEIGHT
TIME 0636 PST			
1007	12.6	12.6	302
1000	12.5	12.4	490
989	11.7	11.4	790
986	12.5	12.2	890
978	12.6	12.2	1080
969	13.2	8.0	1350
965	14.0	4.5	1510
962	15.7	5.9	1610
935	17.6	5.2	2360
917	17.6	1.1	2920
889	16.4	0.1	3810
870	16.2	-6.2	4360
850	18.2	-9.0	5020
TIME 1335 PST			
1006	22.7	12.3	302
1000	21.6	12.4	470
993	20.1	11.6	640
942	16.5	10.7	2100
934	17.4	7.5	2360
927	18.0	6.8	2590
907	17.8	5.1	3220
862	17.8	-9.0	4630
850	19.8	-7.0	5040

DATE 1973 Nov. 9

PRES	TEMP	DEW PT	HEIGHT
TIME 0652 PST			
1009	14.7	12.0	302
1000	13.7	11.9	550
971	12.2	11.9	1350
945	10.0	10.6	2070
943	11.5	11.2	2170
937	12.0	3.0	2330
929	12.2	-0.7	2590
915	15.5	-2.4	2990
890	15.7	-2.7	3740
885	15.7	-11	3940
871	15.5	-11	4360
863	15.9	-11	4630
858	16.5	-10	4770
850	16.3	-11	5050
TIME 1330 ST			
1008	20	11.7	302
1002	17.6	10.7	460
1000	17.6	11.4	520
953	13.6	10.8	1870
944	13.5	10.5	2130
933	17.2	5.7	2430
908	18.0	4.2	3230
897	18.2	-2.2	3540
874	17.5	-9.0	4270
850	17.8	-9.0	5060

APPENDIX F

DAILY SUMMARY OF WEATHER DATA

DAILY SUMMARY OF WEATHER DATA STATION: 75N YEAR: 1973 MONTH: Oct. DAY: Tue. DATE: 2

HR	OZ	E_I	Vsb	W_x	Sky	Td	T	W_d	W_s	[illegible]	DD	ff	I_b	T_b	I_t	T_I	IBT	FM	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL	SFO	VNC	TPH	BFL	DAG	TRM
		90	90		82	75	74	65	34				70					72														
00								6	5																							
01								6	3																							
02								6	3																							
03								6	3																							
04								6	3																							
05								6	3																							
06						78	62	10	3	1.0			35	7.2	49	8.1	85	39		16.8	493	15.2										
07			030	H	cy	76	62	10	4	1.0																						
08			030	H	cy	76	62	10	4	1.0																						
09			040	H	cy	72	62	10	3	1.0																						
10			040	H	cy	66	64	10	6	0.7																						
11			040	H	PC	61	69	10	7	.05																						
12			040	H	CLR	59	70	10	8	0.0			30	9.9	54	5.5	88		33	20.2	500	15.0										
13			040	H	CLR	60	72	10	10	0.0																						
14			040	H	CLR	61	71	10	11	0.0																						
15			040	H	CLR	64	69	10	12	0.0																						
16						70	65	10	11	0.4																						
17						80	63	10	9	0.2																						
18						84	62	10	7																							
19						87	60	10	6																							
20								10	5																							
21								10	4																							
22								10	3																							
23								10	4																							
VAR	OZ max	E_I max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Ws 6-9	Ws 6-9	I_{b_x}	T_{b_x}	I_{t_x}	ΔT_{I_x}	IBT_x	MH_x	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL						
99	170	900	040	120	040	59	72			045	555	037	35	72	49	81	85	39	33	168	493	152	25	5	503	77						

	MAX	MIN	PRECIP
PLX	72	62	
LAX	71	59	
BUR	72	60	
LGB	72	62	
ONT	76	58	
PMD	82	48	
POM	75	56	
SBD	74	57	
SG	75	57	
SA			

700595

Wsb_{50} ______ T_{min} 59 Precip ______ 6-12 Wind Total $\frac{27}{142}$ Day $\frac{48}{120}$ Tenths = 0.4 PC

DAILY SUMMARY OF WEATHER DATA   STATION: 75N   YEAR: 1973   MONTH: Oct.   DAY: **Wed.**   DATE: 3

HR	OZ	E_1	Vsb	W_x	Sky	RH	T	a_s	d_s	W	DD	ff	I_b	T_b	I_t	T_I	IBT	MH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	s^2_p	SOL	SFD	°C	TFH	SFL	DAG	TCM
		90	80		82	75	74	05	04				70					72														
00								10	3																							
01								2	3																							
02								2	4																							
03								2	3																							
04								2	4																							
05								6	3																							
06						87	58	2	3	1.0			30	8.5	47	7.0	85	38		15.6	493	15.2										
07			030	H	cy	86	58	2	3	1.0																						
08			025	FH	cy	84	59	2	5	1.0																						
09			025	FH	cy	80	60	6	4	1.0																						
10			025	FH	cy	75	62	6	5	1.0																						
11			025	FH	cy	68	63	10	6	1.0																						
12			030	H	CLR	61	68	10	5	0.0			25	12.1	32	6.3	82		31	19.4	500	15.8										
13			030	H	CLR	56	71	10	8	0.0																						
14			030	H	CLR	50	74	10	11	0.0																						
15			030	H	CLR	60	69	10	10	0.0																						
16						67	67	10	10	0.0																						
17						74	65	10	8	0.0																						
18						75	63	10	7																							
19						81	62	10	5																							
20								10	4																							
21								14	3																							
22								14	2																							
23								14	3																							

VAR	OZ max	E_1 max	Vsb 60	t 5vm	Vsb 70	RH min	T max	WS 6-12	WS 6-9	WD 6-9	I_{b_8}	T_{b_8}	I_{t_8}	T_{I_8}	IBT_8	MH_8	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	s^2_p	SOL
99	100	900	030	134	025	50	74	043	111	037	30	85	47	70	85	38	31	156	493	152	503	15	528	66

	MAX	MIN	PRECIP
PLX	73	57	
LAX	70	55	
BUR	72	54	
LGB	72	57	
ONT	76	55	
PMD	81	37	
PDM	75	53	
SBD	76	56	
SG	76	52	
SA	74	60	

700095

Vsb_{50} T_{min} 56   Precip   6-12 Wind Total $\frac{26}{122}$ Day $\frac{60}{120}$ Tenths = 0.5 PC

DAILY SUMMARY OF WEATHER DATA　STATION: 75A　YEAR: 1973　MONTH: Oct.　DAY: Thurs.　DATE: 4

VAR	OZ	E_1	Vsb	W_x	Sky	RH	T	W_d	W_s	W	CD	ff	I_b	T_b	I_t	T_I	IBT	MH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL	SFO	VYC	TPH	SFL	DAG	TSM
HR		90	80		72	75	74	15	04				70					72														
00								2	2																							
01								2	4																							
02								2	4																							
03								2	3																							
04								2	3																							
05								2	4				sfc																			
06						84	55	2	3	0.0			1	14.3	24	9.3	86	22		14.3	496	18.0										
07			030	H	CLR	84	56	2	3	0.0																						
08			020	H	CLR	78	58	10	3	0.0																						
09			010	H	CLR	68	63	10	4	0.0																						
10			015	H	CLR	62	70	10	4	0.0																						
11			020	H	CLR	57	74	10	6	0.0																						
12			020	H	CLR	54	77	10	8	0.0			9	16.1	18	9.6	87		15	19.4	499	19.0										
13			025	H	CLR	60	81	10	9	0.0																						
14			030	H	CLR	64	78	10	11	0.0																						
15			030	H	CLR	67	74	10	10	0.0																						
16						74	72	10	9	0.3																						
17						84	67	10	7	0.1																						
18						92	65	10	5																							
19						92	62	10	3																							
20								2	3																							
21								6	5																							
22								6	5																							
23								10	2																							
VAR	OZ max	E_1 max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	$I_{b\&}$	$T_{t\&}$	$I_{t\&}$	$\Delta T_{I\&}$	$IBT_\&$	$MH_\&$	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL						
99	358	211	020	116	010	54	81			038	115	030	1	143	24	93	86	22	15	143	496	180	522	9	519	178						

	MAX	MIN	PRECIP
PLX	81	55	
LAX	70	56	
BUR	85	53	
LGB	76	53	
ONT	91	99	
PMD	84	38	
FDM	89	52	
SBD	95	47	
SG	88	99	
SA	77	53	

700595

Vsb_{50} ______　T_{min} 54　Precip ______　6-12 Wind Total $\frac{23}{120}$　Day $\frac{4}{120}$ Tenths = 0 CLR

DAILY SUMMARY OF WEATHER DATA   STATION: 75A   YEAR: 1973   MONTH: Oct.   DAY: Fri.   DATE: 5

HR	90	80	32	75	74	15	63		70					72			
00						10	4										
01						6	2										
02						2	2										
03						6	2										
04						10	4										
05						6	2										
06				93	57	6	4	1.0	13	12.7	34	8.7	88	21	15.6	488	18.0
07	015	FH	cy	92	57	6	3	1.0									
08	008	F	cy	92	58	6	4	1.0									
09	005	F	cy	91	60	10	4	1.0									
10	010	H	cy	84	63	6	5	1.0									
11	015	H	PC	70	68	6	5	0.5									
12	020	H	CLR	64	71	10	8	0.0	22	14.2	37	5.9	88	24	20.0	491	17.8
13	020	H	CLR	58	74	10	9	0.0									
14	020	H	CLR	59	72	10	10	0.0									
15	025	H	CLR	67	69	10	9	0.0									
16				76	66	10	7	0.3									
17				79	63	10	7	0.4									
18				87	62	10	5										
19				88	61	6	6										
20						6	8										
21						6	5										
22						6	4										
23						10	6										

VAR	DZ max	E1 max	Vsh 50	T 5-?	Vsh 70	RH min	T max	6-12	6-9	6-9													SOL
99	100	900	020	138	020	58	74	042	333	037	13	127	34	87	88	21	24	156	488	180 2	9	24	78

Vsh50 T_{min} 57   Precip   6-12 Wind Total $\frac{25}{125}$ Cay $\frac{62}{120}$ Tenths = 0.5 PC

	MAX	MIN	PRECIP
FLX	73	58	
LAX	75	59	
BUR	74	52	
LGB	67	59	
ONT	78	51	
FHD	86	43	
FDW	77	52	
SED	83	47	
SG	88	49	
SA	75	57	

760395

DAILY SUMMARY OF WEATHER DATA STATION: 75N YEAR: 1973 MONTH: Oct. DAY: Mon. DATE: 8

VAR \ HR	OZ	E_I	Vsb	W_x	Cy	RH	T	W_d	W_s	W	DD	FF	I_b	T_b	I_t	T_I	IBT	MH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2P	SOL	SFO	[illegible]°C	TPH	BFL	DAG	TRM
		90	30		92	75	74	75	84				70					72														
00								6	5																							
01								2	5																							
02								2	6																							
03								2	6																							
04								4	7																							
05								2	5																							
06						94	56	2	5	1.0			999					999		138	480	6.8										
07			030	LH	cy	96	56	6	5	1.0																						
08			020	LH	cy	92	57	6	4	1.0																						
09			040	H	cy	90	59	6	5	0.9																						
10			060	H	cy	88	60	6	3	1.0																						
11			080		PC	84	62	10	3	0.7																						
12			100		PC	68	68	10	7	0.6			999						999	17.6	483	7.0										
13			120		PC	68	67	10	11	0.6																						
14						73	66	10	12	0.6																						
15						76	65	10	14	0.6																						
16						78	64	10	13	0.5																						
17						82	62	12	10	0.4																						
18						78	60	10	6																							
19						88	60	10	7																							
20								14	7																							
21								10	5																							
22								6	3																							
23								2	4																							

VAR	OZ max	E_I max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_{b_a}	T_{b_a}	I_{t_a}	T_{I_a}	IBT_a	MH_a	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2P	SOL
99	050					68	70			042	133	047	999					999	999	138	480	68	14	5	516	

	MAX	MIN	PRECIP
PLX	68	56	.02
LAX	69	57	.04
BUR	70	55	T
LGB	68	58	.07
CNT	71	54	T
PMD	67	50	--
FDW	22	53	.03
SBD	66	54	.03
SG	71	55	--
SA	71	56	T

Vsb_{50} ____ T_{min} 56 Precip ____ 6-12 Wind Total $\frac{25}{158}$ Cey $\frac{83}{120}$ Tenths = 0.7 PC

700595

DAILY SUMMARY OF WEATHER DATA STATION: [illegible] YEAR: 1973 Oct. Tue. 9

HR	OZ	E_1	Vsp	Wx	Sky	RH	T				
		90	80		82	75	74	36	04		
00								2	5		
01								2	4		
02								2	5		
03								2	4		
04								2	5		
05								2	4		sfc
06						89	55	2	4		1 13.4 6 0.8 59 999 13.4 480 6.6
07			060	H	PC	88	55	2	5	0.4	19 11.4 26 0.0 65
08			060	H	CLR	84	57	2	5	0.3	
09			060	H	PC	76	64	6	4	0.4	
10			070		PC	68	66	6	6	0.4	
11			070		PC	57	70	2	4	0.4	
12			100		CLR	52	73	10	5	0.3	38 9.5 42 0.6 71 999 22.0 482 8.4
13			070		CLR	52	73	10	9	0.3	
14			080		CLR	57	70	10	12	0.2	
15			100		CLR	63	68	10	12	0.2	
16						66	67	10	8	0.1	
17						60	67	10	8	0.0	
18						70	66	10	7		
19						75	62	10	7		
20								14	4		
21								2	3		
22								2	5		
23								2	4		

VAR	OZ max	E_1 max	Vsp 60	Sum	Vsp 70	RH min	T max
99	000	900	070	110	070	52	74

047 111 047 1 134 6 8 59 999 999 134 480 66 502 9 516 174

	MAX	MIN	PRECIP
FLX	73	55	T
LAX	73	54	
BUR	74	50	
LGB	73	50	
ONT	73	49	
PMD	69	38	
POM	75	49	
SBD	73	50	
SG	75	48	
SA	73	56	

Vsp 50 T_{min} 55 Precip 6-12 Wind Total 28 142

Day $\frac{30}{120}$ Tenths = 0.3 CLR

DAILY SUMMARY OF WEATHER DATA STATION: 75N YEAR 1973 MONTH: Oct. DAY: Wed. DATE: 10

VAR / HR	OZ	E_1	Vsb	W_x	Sky	RH	T	W_d	W_s	[illegible]	DD	ff	I_b	T_b	I_t	T_1	IBT	MM	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2P	SOL	SFO	[illegible]	TRM	SFL	DAG	TRM
		50	80		52	75	74	85	84				70					72														
00								2	4																							
01								2	4																							
02								2	3																							
03								2	3																							
04								2	4																							
05								2	4				sfc																			
06						90	53	2	4	0			1	13.6		1.4	69	999		13.6	486	9.4										
07			060	H	CLR	88	54	2	3	0																						
08			060	H	CLR	82	58	6	3	0																						
09			070		CLR	75	64	10	6	0																						
10			080		CLR	60	69	10	7	0																						
11			150		CLR	46	73	10	8	0																						
12			200		CLR	42	76	10	12	0			8	18.5	10	2.4	74		47	21.6	492	10.8										
13			250		CLR	50	72	10	12	0																						
14			250		CLR	56	70	10	13	0																						
15			250		CLR	48	72	10	11	0																						
16						43	72	10	9	0																						
17						50	69	14	5	0																						
18						56	68	14	5																							
19						56	68	14	5																							
20								14	2																							
21								2	4																							
22								2	4																							
23								2	3																							

VAR	OZ max	E_1 max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_{b_x}	T_{t_x}	I_{t_x}	ΔT_{1_x}	IBT_x	MM_x	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2P	SOL
99	-00	900	080	100	080	42	76			052	113	033	1	13.6	27	1.4	69	999	47	136	486	94	534	17	532	183

	MAX	MIN	PRECIP
PLX	76	54	
LAX	73	54	
BUR	75	50	
LGB	78	51	
CNT	78	45	
PMD	70	33	
FON	78	48	
SBD	78	49	
SG	80	46	
SA	77	50	

Vsb_{50} ______ T_{min} 53 Precip ______ 6-12 Wind Total $\frac{31}{138}$ Sky $\frac{6}{120}$ Tenths = 0 CLR

700595

DAILY SUMMARY OF WEATHER DATA STATION: 75A YEAR: 1973 MONTH: Oct. DAY: Thurs. DATE: 11

VAR / HR	OZ	E_1	Vsb	Wx	Sky	RH	T	W_d	W_s	V
		50	80		32	76	74	36	94	
00								2	4	
01								2	4	
02								2	4	
03								2	5	
04								2	6	
05								2	3	
06						64	55	2	5	0
07			060	H	CLR	62	56	2	4	0
08			060	H	CLR	60	58	2	5	0
09			060	H	CLR	54	62	2	3	0
10			060	H	CLR	46	70	10	3	0
11			060	H	CLR	41	76	10	6	0.1
12			070		CLR	41	78	10	10	0.3
13			070		CLR	46	76	10	11	0.2
14			080		PC	50	74	10	13	0.4
15			080		PC	56	72	10	11	0.4
16						60	70	10	9	0.6
17						66	67	12	7	0.6
18						80	63	10	7	
19						88	62	10	5	
20								8	3	
21								6	2	
22								2	4	
23								2	3	

VAR / HR	CO	PP	I_b	T_b	I_t	T_t	IST	MH	VH	T_{12A}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL	SFO	[illegible]	TPH	[illegible]	[illegible]	TCM
			0					72														
06			sfc																			
07			1	13.4	7	1.7	61	999		13.4	481	10.8										
08			8	14.4	15	0.7	66															
12			999					999		21.6	484	12.0										

VAR	OZ max	E_1 max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Ws 6-9	Ws 6-9	I_{b8}	T_{b8}	I_{t8}	T_{t8}	IST_8	MH_8	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL
99	140	900	060	080	060	41	80			043	111	047	1	134	15	17	66	999	999	134	481	108	517	16	17	178

	MAX	MIN	PRECIP
PLX	77	55	
LAX	73	55	
BUR	80	49	
LGB	80	51	
ONT	81	45	
PMD	74	34	
PCN	80	48	
SBD	80	44	
SG	M	SG	
SA	76	52	

Vsb_{50} —— T_{min} 55 Precip 6-12 Wind Total $\frac{26}{137}$ Day $\frac{26}{120}$ Tenths = 0.2 CLR

700595

DAILY SUMMARY OF WEATHER DATA STATION: 75W YEAR: 1973 MONTH: Oct. DAY: Fri. DATE: 12

VAR / HT	OZ	E_I	Vsb	W_x	Sky	RH	T	W_d	W_s	W	DD	ff	I_b	T_b	I_t	T_I	IBT	MH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL	SFO	K C	TFM	CFL	DAG	TKM
HT		90	80		82	76	74	65	84				70					72														
00								2	3																							
01								2	3																							
02								2	4																							
03								2	4																							
04								2	3																							
05								2	4				sfc																			
06						76	54	2	4	0.1			1	13.4	21	4.4	74	38		13.4	487	13.8										
07			050	H	CLR	70	56	2	4	0.1																						
08			050	H	CLR	60	60	2	4	0.1																						
09			040	H	CLR	52	65	6	3	0.1																						
10			040	H	CLR	46	70	10	4	0.2																						
11			040	H	CLR	38	78	10	6	0.1																						
12			040	H	CLR	37	78	10	7	0.0			14	17.8	24	1.3	78		32	21.2	492	15.4										
13			040	H	CLR	48	78	10	9	0.0																						
14			040	H	CLR	49	78	10	10	0.0																						
15			060	H	CLR	49	76	10	9	0.0																						
16						48	75	10	9	0.1																						
17						52	72	10	6	0.2																						
18						58	68	10	5																							
19						62	66	10	2																							
20								10	3																							
21								10	2																							
22								2	3																							
23								2	2																							
VAR	OZ max	E_I max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_{b*}	T_{b*}	I_{t*}	ΔT_{I*}	IBT_*	MH_*	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL						
99	250	900	040	090	040	37	80			042	111	040	1	134	21	44	74	38	32	134	487	138	516	14	1							

	MAX	MIN	PRECIP
PLX	79	55	
LAX	73	55	
BUR	81	51	
LGB	81	50	
ONT	85	47	
PHD	79	38	
FDN	84	51	
SBD	85	45	
SG	84	47	
SA	81	51	

700595

Vsb_{50} ______ T_{min} 54 Precip ______ 6-12 Wind Total $\frac{25}{113}$ Day $\frac{1}{170}$ Tenths = 0 CLR

DAILY SUMMARY OF WEATHER DATA STATION: 75N YEAR: 1973 MONTH: Oct. DAY: Mon. DATE: 15

VAR / HR	CZ	E_1	Vsb	Wx	Sky	RH	T	Ws	ds	x	DD	ff	I_b	T_b	I_t	T_i	IBT	MH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL	SFO	MIC	TPH	FL	DAG	TSM
		90	80		32	75	74	66	14				70					72														
00								10	3																							
01								16	3																							
02								10	3																							
03								8	2																							
04								6	2																							
05								10	3																							
06						84	56	14	3	0.1			8	12.7	20	11.6	85	18		13.4	505	20.2										
07			015	FH	CLR	84	55	10	3	0.0																						
08			018	FH	CLR	82	56	10	5	0.0																						
09			020	H	CLR	80	58	10	5	0.0																						
10			025	H	CLR	72	64	10	7	0.1																						
11			030	H	CLR	58	72	10	9	0.2																						
12			040	H	PC	54	76	10	7	0.4			7	13.5	20	12.5	88		15	16.4	510	20.2										
13			060	H	CLR	50	77	10	7	0.3																						
14			060	H	CLR	50	79	10	9	0.3																						
15			060	H	CLR	45	80	10	8	0.3																						
16						50	76	10	6	0.3																						
17						54	74	10	8	0.2																						
18						53	73	10	5																							
19						68	66	10	5																							
20								10	3																							
21								2	2																							
22								2	2																							
23								6	2																							

VAR	CZ max	E_1 max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_{b_4}	T_{b_4}	I_{t_4}	T_{i_4}	IBT_4	MH_4	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL
99	200	900	030	114	030	45	82			053	755	037	8	127	20	116	85	18	15	134	505	202	521	6	20	164

	MAX	MIN	PRECIP
PLX	80	56	
LAX	68	56	
BUR	87	56	
LGB	77	55	
ONT	95	53	
PMD	89	43	
PDN	90	54	
SBD	96	52	
SG	87	49	
SA	M	SG	

Vsb_{50} ______ T_{min} 55 Precip ______ 6-12 Wind Total $\frac{32}{111}$ Day $\frac{22}{220}$ Tenths = 0.2 CLR

700595

DAILY SUMMARY OF WEATHER DATA STATION: 75N YEAR: 1973 MONTH: Oct. DAY: Tue. DATE: 16

VAR / HR	OZ	E_1	Vsb	W_x	Sky	RH	T	W_d	W_s	W	DD	ff	I_b	T_b	I_t	ΔT_I	IBT	MM	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL	SFO	WOC	TPH	SFL	DAG	TKM
HR		90	80		82	76	74	65	54				70					72														
00								8	3																							
01								10	1																							
02								2	2																							
03								6	2																							
04								6	2																							
05								6	2																							
06						78	59	6	2	0.4			7	13.4	21	11.4	87	23		14.2	503	19.6										
07			025	FH	PC	79	58	2	3	0.4																						
08			025	H	CLR	78	59	2	2	0.3																						
09			020	H	PC	60	62	10	4	0.4																						
10			012	H	CLR	48	70	10	6	0.9																						
11			012	H	cy	46	74	10	6	0.8																						
12			015	H	PC	58	75	10	6	0.6			4	15.4	23	10.7	90		20	17.2	509	19.8										
13			030	H	PC	52	80	10	6	0.7																						
14			030	H	PC	48	86	10	7	0.7																						
15			030	H	PC	44	86	10	7	0.6																						
16						46	84	10	6	0.7																						
17						46	82	10	6	0.7																						
18						50	76	10	3																							
19						60	70	10	3																							
20								10	4																							
21								10	2																							
22								10	3																							
23								10	2																							
VAR	OZ max	E_1 max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_{b_a}	T_{b_a}	I_{t_a}	ΔT_{I_a}	IBT_a	MH_a	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL						
99	370	211	012	106	012	44	87			038	311	023	7	134	21	114	87	23	20	142	503	196	533	11	512	116						

	MAX	MIN	PRECIP
PLX	86	58	
LAX	66	58	
BUR	90	55	
LGB	81	54	
ONT	95	56	
PMD	86	45	
PDW	92	55	
SBD	93	56	
SG	90	50	
SA	82	53	

700595

Vsb_{50} ______ T_{min} 58 Precip ______ 6-12 Wind Total $\frac{23}{90}$ Day $\frac{72}{120}$ Tenths = 0.6 PC

DAILY SUMMARY OF WEATHER DATA STATION: 75W YEAR: 1973 MONTH: Oct. DAY: Wed. DATE: 17

VAR / HR	OZ	E_I	Vsb	W_x	Sky	RH	T	W_d	W_s	k	DD	ff	I_b	T_b	I_t	T_I	IBT	MH	HH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	$\sigma^2 p$	SOL
		90	60		82	76	74	85	84				70					72								
00								10	2																	
01								2	4																	
02								10	2																	
03								10	2																	
04								14	3																	
05								2	3																	
06						65	62	2	4	0.1			4	10.9	16	14.9	85	36		11.6	509	19.0				
07			040	H	CLR	56	62	2	2	0.1																
08			040	H	CLR	50	64	2	4	0.1																
09			025	H	CLR	44	70	10	5	0.3																
10			030	H	CLR	38	79	10	6	0.3																
11			040	H	PC	50	78	10	6	0.4																
12			060	H	PC	42	84	14	7	0.4			6	17.8	13	9.6	87		21	20.2	513	19.4				
13			060	H	PC	38	88	10	9	0.7																
14			060	H	PC	38	90	10	10	0.7																
15			060	H	PC	34	90	10	12	0.4																
16						35	86	10	10	0.4																
17						36	84	10	6	0.4																
18						44	78	10	3																	
19						46	77	10	3																	
20								6	2																	
21								2	3																	
22								2	3																	
23								2	4																	

VAR	OZ max	E_I max	Vst 60	t 5v	Vst 70	RH min	T max	Ws 6-12	Wd 5-9	Ws 6-9	I_{b_8}	T_{t_8}	I_{t_8}	T_{I_8}	IBT_8	MH_8	HH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	$\sigma^2 p$	SOL
99	270	900	025	091	025	34	90	045	111	033	4	109	16	149	85	36	21	116	509	190	529	3	4	165

Vsb_{50} T_{min} 58 Precip 6-12 Wind Total $\frac{27}{115}$ Day $\frac{43}{120}$ Tenths = 0.4 PC

	MAX	MIN	PRECIP
PLX	89	46	
LAX	73	53	
BUR	94	57	
LGB	89	53	
ONT	97	56	
PMD	90	46	
FCW	96	58	
SBD	94	55	
SG	–		
SA	–		

700595

DAILY SUMMARY OF WEATHER DATA STATION: 75N YEAR: 1973 MONTH: Oct. DAY: Thurs. DATE: 18

VAR HR	OZ	E_1	Vsb	θ_x	Sky	RH	T	W_1	W_s	W	DD	ff	I_b	T_b	I_t	T_l	IBT	MH	MH	T_{125}	H_{850}	T_{850}	P	T	s^2_p	SOL	SFO	C	[illegible]	BFL	DAG	TSM
HR		90	80		32	75	74	65	84				70					72														
00								2	5																							
01								2	3																							
02								2	3																							
03								16	4																							
04								2	5																							
05								2	4				sfc																			
06						46	72	2	4	0.6			1	17.5	13	8.2	83	50		17.4	512	19.4										
07			040	H	PC	46	72	2	4	0.5																						
08			060	H	PC	46	71	2	4	0.4																						
09			080		CLR	45	74	10	2	0.3																						
10			100		CLR	42	78	10	5	0.2																						
11			120		CLR	36	85	10	8	0.3																						
12			120		PC	33	93	10	10	0.5			3	22.8	19	5.0			31	26.0	519	19.4										
13			120		Pcy	32	93	10	12	0.6																						
14			150		PC	34	93	10	10	0.4																						
15			180		CLR	25	86	12	9	0.3																						
16						24	80	10	9	0.3																						
17						26	78	10	4	0.4																						
18						30	75	10	5																							
19						36	72	6	2																							
20								6	3																							
21								6	2																							
22								2	2																							
23								2	1																							
VAR	OZ max	E_1 max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Wd 6-9	I_{b_s}	T_{b_s}	I_{t_s}	T_{l_s}	IBT_s	MH_s	MH	T_{125}	H_{650}	T_{850}	P	T	d^2p	SOL						
99	270	900	040	070	040	24	93			045	111	040	1	175	13	82	83	50	31	174	512	194	528	5	1	145						

	MAX	MIN	PRECIP
PLX	91	68	
LAX	84	59	
BUR	95	64	
LGB	93	60	
CNT	96	59	
PMD	89	50	
PDN	94	63	
SBD	94	55	
SG	96	52	
SA	91	58	

7C0595

Vsb_{50} ______ T_{min} 70 Precip ______ 6-12 Wind Total $\frac{27}{123}$ Cey $\frac{48}{120}$ Tenths = 0.4 PC

DAILY SUMMARY OF WEATHER DATA STATION: 75N YEAR: 1973 MONTH: Oct. DAY: Fri. DATE: 19

VAR HR	OZ	E_1	Vsb	V_x	Sky	RH	T	W_d	W_s	N	DD	ff	I_b	T_b	I_t	T_i	IBT	MH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL	SFO		TFM	EFL	DAG	TRM
		90	50		32	76	74	66	64				70					72														
00								2	4																							
01								2	3																							
02								2	4																							
03								2	4																							
04								2	5																							
05								2	3				sfc																			
06						40	66	2	4				1	17.2	22	8.6	89	999		17.2	506	18.2										
07			060	H	CLR	42	66	2	5	0.0																						
08			050	H	CLR	36	70	2	4	0.0																						
09			050	H	CLR	30	76	6	4	0.0																						
10			030	H	CLR	27	84	10	6	0.0																						
11			030	H	CLR	26	87	10	5	0.0																						
12			040	H	CLR	25	88	10	8	0.0			999						35	294	510	19.0										
13			070		CLR	26	90	10	10	0.0																						
14			120		CLR	24	90	10	10	0.1																						
15			150		CLR	26	88	10	9	0.1																						
16						28	83	10	10	0.0																						
17						30	80	12	8	0.0																						
18						40	70	12	8																							
19						54	68	10	6																							
20								10	6																							
21								8	4																							
22								6	5																							
23								10	4																							
VAR	OZ max	E_1 max	Vst 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_{b_8}	T_{b_8}	I_{t_8}	T_{i_8}	IBT_8	MH_8	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL						
99	270	211	025	101	025	24	91			047	111	043	1	172	22	86	89	999	35	172	506	182	526	7	2	157						

	MAX	MIN	PRECIP
PLX	91	66	
LAX	57	60	
BUR	92	62	
LGB	91	55	
ONT	94	60	
PMD	88	51	
FCM	93	60	
SBD	91	56	
SG	95	56	
SA	90	57	

700595

Vsb_{50} ______ T_{min} 58 Precip ______ 6-12 Wind Total $\frac{28}{139}$ Day $\frac{2}{110}$ Tenths = 0 CLR

DAILY SUMMARY OF WEATHER DATA STATION: 75W YEAR: 1973 MONTH: Oct. DAY: Mon. DATE: 22

VAR / HR	OZ	E_I	Vsb	W_x	Sky	RH	T	W_d	W_s	W	DD	ff	I_b	T_b	I_t	T_I	IBT	MH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL	SFO	WMC	TFH	SFL	DAG	TRM
		20	60		92	76	74	65	84				70					72														
00								2	3																							
01								6	2																							
02								2	2																							
03								2	3																							
04								2	4																							
05								2	2																							
06						70	58	6	3				27	10.7	32	0.3	68	37		16.0	490	12.6										
07			040	H	cy	70	59	6	5	1.0			35	10.0	49	2.6	80															
08			040	H	cy	70	60	2	4	1.0																						
09			040	H	cy	68	60	6	3	1.0																						
10			040	H	cy	62	63	6	4	1.0																						
11			040	H	cy	58	64	6	7	1.0																						
12			040	H	cy	63	64	10	6	1.0			46	6.5	50	2.5	74		49	17.2	497	9.0										
13			040	H	cy	64	66	8	5	1.0																						
14			050	H	cy	60	66	10	4	.8																						
15			010		Pcy	56	67	10	6	0.6																						
16						58	66	10	9	0.6																						
17						64	64	10	8	0.8																						
18						71	61	10	6																							
19						72	60	12	5																							
20								12	5																							
21								10	4																							
22								6	3																							
23								6	4																							

VAR	OZ max	E_I max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_{b*}	T_{b*}	I_{t*}	ΔT_{I*}	IBT_*	MH_*	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL
99	070					56	68			043	331	040	27	107	49	19	80	37	49	160	490	126	10	15	507	75

	MAX	MIN	PRECIP
PLX	71	60	
LAX	70	60	
BUR	68	59	
LGB	72	62	
CNT	69	52	
PHD	74	41	
FDM	MSG		
SBD	66	49	
SG	70	58	
SA	70	52	

Vsb_{50} ______ T_{min} 58 Precip ______ 6-12 Wind Total $\frac{26}{107}$ Day $\frac{98}{110}$ Tenths = 0.9 cy

700595

DAILY SUMMARY OF WEATHER DATA STATION: 75W YEAR: 1973 MONTH: Oct. DAY: Tue. DATE: 23

VAR / HR	OZ	E_1	Vsb	V_x	Sky	RH	T	W_d	W_s	N	DD	ff	I_b	T_b	I_t	T_I	IST	NH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL	SFO	NMC	TRH	SFL	DAG	TRM
		50	80		82	75	74	06	04				70					72														
00								6	4																							
01								4	5																							
02								4	4																							
03								6	5																							
04								6	4																							
05								4	4																							
06						74	59	4	5				42	8.0	50	0.5	73	999		16.6	500	8.5										
07			040	H	cy	73	60	6	6	0.9																						
08			060	H	cy	72	60	6	6	0.9																						
09			120		cy	71	61	10	8	1.0																						
10			200		cy	68	62	10	8	1.0																						
11			200		cy	65	62	10	8	0.9																						
12			200		cy	60	64	10	10	0.8			999						999	18.4	504	8.2										
13			150		PC	68	62	10	10	0.6																						
14			150		PC	60	63	10	11	0.4																						
15			150		CLR	54	63	10	11	0.1																						
16						48	62	10	9	0.1																						
17						54	60	10	7	0.1																						
18						66	58	10	5																							
19						68	58	6	3																							
20								6	4																							
21								2	3																							
22								2	4																							
23								2	4																							
VAR	OZ max	E_1 max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_{b_a}	T_{b_a}	I_{t_a}	T_{I_a}	IBT_a	MH_a	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL						
99	040	900	150	140	150	48	66			068	233	057	42	80	50	5	73	999	999	166	500	85	20	6	10	-						

	MAX	MIN	PRECIP
PLX	69	61	0.10
LAX	68	61	0.04
BUR	69	60	
LGB	71	61	0.13
ONT	69	57	T
PMD	60	59	T
PDM	69	57	0.23
SBD	70	54	
SG	71	58	0.25
SA	----		

700595

Vsh_{50} ______ T_{min} 55 Precip ______ 6-12 Wind Total $\frac{41}{148}$ Day $\frac{68}{110}$ Tenths = 0.6 PC

DAILY SUMMARY OF WEATHER DATA STATION: 75W YEAR: 1973 MONTH: Oct. DAY: Wed. DATE: 24

VAR / HR	OZ	E_I	Vsb	W_x	Sky	RH	T	W_d	W_s	N	CD	ff	I_b	T_b	I_t	ΔT_I	IBT	MH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL	SFO	WNC	TFA	SFL	DAG	TSM
		90	80		82	76	74	86	84				70					72														
00								2	3																							
01								2	4																							
02								2	4																							
03								2	5																							
04								2	3																							
05								2	5																							
06						68	52	2	4				27	11.4	38	3.3	77	38		12.8	490	14.0										
07			040	H	CLR	65	53	2	4	0.0																						
08			060	H	CLR	62	55	2	3	0.0																						
09			070		CLR	54	60	6	3	0.0																						
10			070		CLR	40	67	10	5	0.0																						
11			070		CLR	35	71	10	4	0.0																						
12			070		CLR	33	74	10	7	0.0			6	15.4	19	3.9	76		22	20.2	497	14.8										
13			070		CLR	38	76	10	8	0.0																						
14			090		CLR	38	72	10	10	0.0																						
15			120		CLR	40	70	10	7	0																						
16						38	70	10	6	0																						
17						44	66	10	5	0																						
18						50	64	8	4																							
19						56	62	6	2																							
20								2	4																							
21								2	4																							
22								2	3																							
23								2	4																							

VAR	OZ max	E_I max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_{b_x}	T_{b_x}	I_{t_x}	ΔT_{I_x}	IBT_x	MH_x	MH	T_{125}	H_{650}	T_{650}	ΔP	ΔT	d^2p	SOL
99	170	900	070	090	040	33	77			038	111	037	27	114	38	33	77	38	22	128	490	140	543	17	563	158

	MAX	MIN	PRECIP
PLX	77	54	
LAX	73	54	
BUR	82	50	
LGB	80	52	
ONT	84	45	
PHD	74	34	
PDM	83	48	
SBD	85	44	
SG	82	46	
SA	77	50	

700595

Vsb_{50} ______ T_{min} 51 Precip ______ 6-12 Wind Total $\frac{23}{111}$ Day $\frac{0}{110}$ Tenths = 0 CLR

DAILY SUMMARY OF WEATHER DATA STATION: 75W YEAR: 1973 MONTH: Oct. DAY: Thurs. DATE: 25

VAR	OZ	E_I	Vsb	W_x	Sky	RH	T	W_d	W_s		CD	ff	I_b	T_b	I_t	T_I	IBT	MH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL	SFO	C	TFM	SFL	DAG	TDM
HR		90	80		82	76	74	06	24				70					72														
00								2	3																							
01								2	4																							
02								2	2																							
03								2	2																							
04								2	4																							
05								2	4				sfc																			
06						68	53	2	3				1	13.9	23	4.8	84	24		13.9	491	15.8										
07			040	H	CLR	63	54	2	5	0.0																						
08			050	H	CLR	60	56	2	3	0.0																						
09			050	H	CLR	50	62	10	4	0.0																						
10			040	H	CLR	40	68	10	2	0.0																						
11			030	H	CLR	34	74	10	5	0.0																						
12			025	H	CLR	36	75	10	7	0.0			6	17.4	8	1.2	68		20	20.4	494	15.8										
13			060	H	CLR	42	73	10	10	0.0			13	18.0	20	1.9	77															
14			040	H	CLR	50	71	10	8	0.0																						
15			060	H	CLR	44	71	12	5	0.0																						
16						42	72	10	8	0																						
17						50	66	10	6	0																						
18						70	60	10	3																							
19						70	59	6	3																							
20								6	4																							
21								2	4																							
22								6	3																							
23								6	5																							

VAR	OZ max	E_I max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_{b4}	T_{b4}	I_{t4}	T_{I4}	IBT_4	MH_4	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL
99	170	900	025	121	025	34	77			037	111	037	1	139	23	48	84	24	20	139	491	158	538	20	5	151

	MAX	MIN	PRECIP
PLX	77	55	
LAX	74	56	
BUR	79	50	
LGB	75	52	
CNT	84	48	
PMD	77	33	
FDM	83	49	
SBD	83	44	
SG	81	47	
SA	77	55	

700595

Vsb_{50} ______ T_{min} 53 Precip ______ 6-12 Wind Total $\frac{22}{109}$ Day $\frac{0}{110}$ Tenths = 0 CLR

DAILY SUMMARY OF WEATHER DATA STATION: 75W YEAR: 1973 MONTH: Oct. DAY: Fri. DATE: 26

VAR HR	OZ	E_I	Vsb	W_x	Sky	RH	T	W_d	W_s	W	DD	ff	I_b	T_b	I_t	T_I	IBT	MH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL	SFO	VIC	TPH	EFL	DAG	TRM
		50	60		32	75	74	65	84				70					72														
00								6	3																							
01								6	2																							
02								6	3																							
03								2	3																							
04								2	3																							
05								2	4																							
06						72	54	2	4				12	13.8	27	4.2	77	38		14.6	492	15.4										
07			015	FH	CLR	72	52	2	4	0.3																						
08			025	H	PC	64	53	2	4	0.7																						
09			030	H	PC	50	60	14	2	0.6																						
10			030	H	PC	40	64	10	4	0.6																						
11			020	H	CLR	35	71	10	4	0.3																						
12			030	H	CLR	31	75	10	5	0.3			10	18.1	14	2.4	75		29	20.4	498	16.4										
13			030	H	CLR	24	80	10	6	0.3			28	19.4	34	0.6	85															
14			030	H	CLR	34	78	10	8	0.2																						
15			040	H	CLR	41	73	10	8	0.1																						
16						46	70	12	7	0.1																						
17						55	66	10	6	0.0																						
18						56	64	10	4																							
19						60	62	6	4																							
20								6	2																							
21								2	2																							
22								2	3																							
23								2	3																							
VAR	OZ max	E_I max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_{b_a}	T_{b_a}	I_{t_a}	ΔT_{I_a}	IBT_a	MH_a	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL						
99	150	900	020	113	020	24	81			037	111	040	12	138	27	42	77	38	29	146	492	154	536	17	2	131						

	MAX	MIN	PRECIP
PLX	82	55	
LAX	72	57	
BUR	84	50	
LGB	77	58	
CNT	88	50	
PMD	76	36	
PDM	86	50	
SBD	86	46	
SG	86	47	
SA	78	51	

700595

Vsb_{50} ______ T_{min} 52 Precip ______ 6-12 Wind Total $\frac{22}{98}$ Day $\frac{35}{110}$ Tenths = 0.3 CLR

DAILY SUMMARY OF WEATHER DATA　　STATION: 75N　　YEAR: 1973　　MONTH: Oct.　　DAY: Sat.　　DATE: 27

VAR / HR	OZ	E_I	Vsb	W_x	Sky	RH	T	W_j	W_s	N	DD	ff	I_b	T_b	I_t	T_i	IBT	MH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	σ^2_P	SOL	SFO	C	TFX	SFL	DIG	TRK
HR		50	20		82	75	74	35	84				70					72														
00								2	3																							
01								2	3																							
02								2	3																							
03								2	5																							
04								2	5																							
05								2	6				sfc																			
06						52	56	2	7				1	13.3	16	11.9	85	999		13.3	507	18.0										
07			040	H	CLR	50	55	2	5	0.0																						
08			040	H	CLR	36	60	2	5	0																						
09			050	H	CLR	26	66	2	5	0																						
10			070		CLR	20	78	2	2	0																						
11			070		CLR	17	84	10	3	0																						
12						14	91	14	4	0			73	13.4	84	0.6	101		999	30.0	512	18.6										
13						12	94	10	6	0																						
14						12	93	10	8	0																						
15						13	92	10	8	0																						
16						15	89	10	9	0																						
17						16	84	10	3	0																						
18						22	78	10	2																							
19						30	74	2	3																							
20								2	5																							
21								2	5																							
22								2	5																							
23								2	4																							

VAR	OZ max	E_I max	Vsb 60	t	Vsb 70	RH min	T max			ws 6-12	ws 6-9	ws 6-9	I_b	T_b	I_t	T_i	IBT	MH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	σ^2_P	SOL
99	140					12	95			045	111	057	1	133	16	119	85	999	999	133	507	180	573	19	537	

	MAX	MIN	PRECIP
PLX	95	55	
LAX	91	55	
BUR	95	53	
LGB	96	51	
ONT	94	55	
PMD	80	33	
PDN	MSG		
SBD	91	51	
SG	95	48	
SA	MSG		

TJ0595

Vsb_{50}　　T_{min} 53　　Precip　　6-12 Wind Total $\frac{27}{110}$　　Day $\frac{0}{110}$ Tenths = 0 CLR

Reproduced from best available copy.

DAILY SUMMARY OF WEATHER DATA STATION: 75N YEAR: 1973 MONTH: Oct. DAY: Mon. DATE: 29

VAR	OZ	E_I	Vsb	V_x	Sky	RH	T	W_d	W_s	x	DD	ff	I_b	T_b	I_t	T_I	IBT	MH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2P	SOL	STD	C	T/H	SFL	DAG	TRM
HR		50	50		62	75	74	65	64				70					72														
00								16	6																							
01								16	5																							
02								16	4																							
03								16	5																							
04								2	3																							
05								2	4				sfc																			
06						35	56	2	4				1	13.7	7	8.3	73			13.6	498	18.6										
07						32	60	2	4				11	21.1	23	1.6	84	40														
08			040	H	CLR	30	66	2	3	0.0																						
09			060	H	CLR	26	74	10	4	0.0																						
10			060	H	CLR	25	77	10	5	0.0																						
11			060	H	CLR	25	79	6	6	0.0																						
12			070		CLR	25	82	6	5	0.0			12	21.4	22	8.2	82	43		27.0	503	18.6										
13			080		CLR	24	84	10	6	0.0																						
14			080		CLR	25	85	10	6	0.0																						
15			080		CLR	24	87	12	5	0.0																						
16			080		CLR	26	85	12	6	0.0																						
17						28	81	12	4	0.0																						
18						30	78	14	2																							
19						34	75	2	4																							
20								16	2																							
21								2	4																							
22								2	5																							
23								2	4																							

VAR	OZ max	E_I max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	$I_{b\&}$	$T_{b\&}$	$I_{t\&}$	$\Delta T_{I\&}$	$IBT_{\&}$	$MH_{\&}$	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2P	SOL
99	170	900	040	080	040	24	88			043	111	037	1	137	23	90	84	40	43	136	498	186	562	14	1	215

	MAX	MIN	PRECIP
PLX	86	57	
LAX	84	53	
BUR	85	53	
LGB	84	52	
ONT	90	47	
PMD	77	37	
POM	88	54	
SBD	89	50	
SG	88	47	
SA	85	49	

700595

Vsb_{50} ______ T_{min} 56 Precip ______ 6-12 Wind Total $\frac{26}{105}$ Day $\frac{0}{110}$ Tenths = 0 CLR

DAILY SUMMARY OF WEATHER DATA STATION: 75W YEAR: 1973 MONTH: Oct. DAY: Tue. DATE: 30

HR	OZ	E_I	Vsp	W_x	Sky	RH	T	W_d	W_s	x	DD	ff	I_b	T_b	I_t	T_I	IBT	MH	Pm	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL	SFO	NHC	TFN	DFL	DAG	TRM
HR		90	80		82	76	78	76	84				70					72														
00								16	5																							
01								16	5																							
02								2	3																							
03								2	4																							
04								2	5																							
05								2	5				sfc																			
06						38	59	2	5				1	15.6	10	6.4	76	48		15.6	507	17.0										
07						34	61	2	5	0																						
08			060	H	CLR	33	61	2	5	0.0																						
09			060	H	CLR	26	70	14	3	0.0																						
10			060	H	CLR	21	78	14	4	0.0																						
11			060	H	CLR	19	85	12	7	0.0																						
12			080		CLR	17	86	10	7	0.0			999						44	28.6	512	17.6										
13			080		CLR	16	88	[illegible]	9	0.0																						
14			100		CLR	17	86	10	7	0.0																						
15			100		CLR	18	86	10	9	0.0																						
16			100		CLR	18	83	10	7	0.0																						
17						18	80	12	5	0.0																						
18						19	78	10	3																							
19						20	74	2	3																							
20								2	5																							
21								2	3																							
22								2	3																							
23								16	5																							
VAP	OZ max	E_I max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_b	T_b	I_t	T_I	IBT	MH	MH	T_{125}	H_{850}	T_{850}	P	ΔT	d^2p	SOL						
99	170	900	060	080	060	16	88			048	11	050	1	156	10	64	76	48	44	156	507	170	573	16	511	209						

	MAX	M.N	PRECIP
PLX	87	59	
LAX	87	56	
BUR	85	59	
LGB	91	52	
ONT	89	63	
PMD	79	35	
PDM	59	55	
SBD	86	51	
SG	91	49	
SA	93	50	

700595

Vsh_{50} T_{min} 59 Precip 6-12 Wind Total $\frac{29}{120}$ Day $\frac{0}{110}$ Tenths = 0 CLR

DAILY SUMMARY OF WEATHER DATA STATION: 75W YEAR: 1973 MONTH: Oct. DAY: Wed. DATE: 31

VAR / HR	OZ	E_I	Vsb	W_x	Sky	RH	T	W_d	W_s	N	DD	ff	I_b	T_b	I_t	T_I	IST	FH	MH	T_{125}	H_{650}	T_{650}	ΔP	ΔT	d^2p	SOL	SFO	KMC	TRH	STL	CAS	TRM
HR		90	80		82	76	74	05	34				70					72														
00								2	6																							
01								2	4																							
02								2	5																							
03								2	4																							
04								2	5																							
05								2	4				sfc																			
06						30	63	2	5				1	15.1	14	7.7	79	42		15.1	503	18.4										
07						31	60	2	4	0																						
08			060	H	CLR	32	64	2	5	0																						
09			070		CLR	27	72	4	4	0.0																						
10			070		CLR	24	79	6	5	0.0																						
11			070		CLR	21	85	6	5	0.0																						
12			060	H	CLR	19	89	10	6	0.0			4	20.0	11	3.0	78		40	23.2	504	18.8										
13			060	H	CLR	20	87	10	8	0.0			14	22.5	20	1.1	84															
14			050	H	CLR	26	86	10	9	0.0																						
15			050	H	CLR	34	82	10	7	0.0																						
16			050	H	CLR	30	81	12	7	0.0																						
17						28	78	10	6	0																						
18						30	74	10	4																							
19						34	70	8	2																							
20								4	4																							
21								6	4																							
22								4	4																							
23								2	3																							
VAR	OZ max	E_I max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	$I_{b\&}$	$T_{b\&}$	$I_{t\&}$	$T_{I\&}$	$IBT_\&$	$MH_\&$	MH	T_{125}	H_{650}	T_{650}	ΔP	ΔT	d^2p	SOL						
99	150	213	050	140	050	19	89			047	111	047	1	151	14	77	79	42	40	151	503	184	549	18	24	206						

	MAX	MIN	PRECIP
PLX	86	60	
LAX	83	55	
BUR	86	57	
LGB	81	50	
CNT	89	53	
PMD	84	36	
FDW	89	55	
SBD	88	49	
SG	88	49	
SA	89	48	

700595

Vsb_{50} ______ T_{min} 60 Precip ______ 6-12 Wind Total $\frac{28}{120}$ Day $\frac{0}{110}$ Tenths = 0 CLR

DAILY SUMMARY OF WEATHER DATA STATION: 75W YEAR: 1973 MONTH: Nov. DAY: Thurs. DATE: 1

HR	PZ	E_I	Vsb	W_x	Dy	RH	T	W_3	W_s	W	DD	ff	I_b	T_b	I_t	T_I	IBT	IH	MH	T_{12}	H_{850}	T_{850}	P	T	d^2P	SOL	PO	C	TH	BFL	DAG	TSW
		90	80		92	75	74	35	84				70					72														
00								6	4																							
01								4	2																							
02								2	1																							
03								2	2																							
04								2	3																							
05								2	2																							
06						72	57	2	4				16	11.0	23	6.0	74	19		14.8	482	16.4										
07			020	H	PC	68	56	2	4	0.5																						
08			020	H	PC	60	56	4	4	0.5																						
09			030	H	PC	54	60	6	3	0.5																						
10			040	H	PC	48	66	6	3	0.6																						
11			040	H	cy	52	67	6	4	0.8																						
12			060	H	PC	48	67	6	6	0.6			23	13.5	48	4.0	89		26	21.2	484	17.4										
13			040	H	PC	48	68	10	8	0.6																						
14			040	H	PC	50	68	10	10	0.5																						
15			040	H	PC	59	68	10	12	0.7																						
16						57	68	10	12	0.7																						
17						68	64	10	10	0.8																						
18						66	62	6	8																							
19						66	61	6	8																							
20								6	8																							
21								6	10																							
22								6	7																							
23								6	8																							

VAR	OZ max	E_I max	Vst 60	t 5vm	Vsb 70	RH min	T max	Ws 6-12	ws 6-9	ws 6-9	I_{b_8}	T_{b_8}	I_{t_8}	T_{I_8}	IBT_8	MH_8	MH	T_{125}	H_{850}	T_{850}	P	T	d^2P	SOL
79	170	900	020	092	020	48	71	037	112	040	16	110	23	60	74	19	26	148	482	164				

	MAX	MIN	PRECIP
PLX	71	56	
LAX	72	57	
BUR	73	50	
LGB	70	56	
ONT	75	46	
FHO	79	51	
FDN	74	52	
SBD	76	46	
SG	82	49	
SA	82	52	

703595

Vsb_{50} T_{min} 56 Precip 6-12 Wind Total $\frac{22}{143}$ Day $\frac{68}{110}$ Tenths = .6 PC

DAILY SUMMARY OF WEATHER DATA STATION: 75W YEAR: 1973 MONTH: Nov. DAY: Fri.
DATE: 2

VAR / HR	CZ	E_1	Vsb	W_x	Sky	RH	T	W_d	W_s	N	DD	ff	I_b	T_b	I_t	T_I	IBT	MH	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2P	SOL	SFO	[illegible]	TRH	BFL	DAG	TRM
		90	80		92	76	74	66	84				70					72														
00								6	5																							
01								6	6																							
02								6	5																							
03								4	3																							
04								4	4																							
05								6	5																							
06						71	57	6	4				999					999		16.0	484	5.0										
07						72	57	6	4	0.5																						
08			050	H	PC	70	58	6	7	0.7																						
09			060	H	cy	64	59	6	7	0.9																						
10			060	H	cy	60	61	8	7	1.0																						
11			070		cy	56	63	8	8	0.9																						
12			070		cy	55	64	8	8	0.9			999						999	18.4	491	6.2										
13			150		PC	52	64	10	9	0.7																						
14			120		cy	49	66	10	8	0.8																						
15			120		cy	49	67	10	8	0.9																						
16			120		cy	60	64	10	7	0.9																						
17						64	62	10	5																							
18						67	60	10	4																							
19						67	58	10	6																							
20								6	5																							
21								6	6																							
22								6	6																							
23								6	5																							

VAR	CZ max	E_1 max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_{b_a}	T_{b_a}	I_{t_a}	T_{I_a}	IBT_a	MH_a	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2P	SOL
99	170	900	060	100	060	49	67			062	333	050	999					999	999	160	484	50	23	10		

	MAX	MIN	PRECIP
PLX	67	61	
LAX	68	60	
BUR	66	58	
LGB	67	58	
CNT	70	55	
FHD	67	49	
FDN	69	57	
SPD	67	56	
SG	75	58	
SA	73	58	

700595

Vsb_{50} ______ T_{min} 57 Precip ______ 6-12 Wind Total 37 / 142 Day $\frac{82}{100}$ Tenths = .8 Cldy

DAILY SUMMARY OF WEATHER DATA

STATION: 72N YEAR: 1973 MONTH: Nov. DAY: Mon. DATE: 5

VAR	OZ	E_1	Vsb	W_x	Sky	RH	T	W_d	W_s	W	DD	ff	I_b	T_b	I_t	T_I	IST	[illegible]	MH	T_{125}	H_{850}	T_{850}	P	T	d^2p	SOL	SFO	MIC	THA	SFL	DAG	TEM
		90	90		82	75	74	86	84				70					72														
00								2	4																							
01								2	4																							
02								2	4																							
03								2	4																							
04								2	5																							
05								2	5																							
06						55	50	2	3				27	10.9	50	0.7	79	35		11.2	501	11.6										
07						54	51	2	3	0.1																						
08			D60	H	CLR	49	54	2	4	0.1																						
09			060	H	CLR	42	59	2	3	0.1																						
10			D60	H	CLR	33	65	10	4	0.2																						
11			060	H	CLR	32	69	10	5	0.2																						
12			080		CLR	34	71	10	2	0.2			19	13.0	35	0.6	74		29	18.6	505	12.2										
13			090		CLR	36	68	10	10	0.1																						
14			100		CLR	38	67	10	9	0.1																						
15			120		CLR	39	66	10	9	0.1																						
16			150		CLR	40	65	10	8	0.1																						
17						45	62	10	6																							
18						49	60	10	4																							
19						54	59	8	4																							
20								2	3																							
21								2	5																							
22								2	4																							
23								2	5																							

VAR	OZ max	E_1 max	Vsb 60	t Sv-	Vsb 70	RH min	T max	Ws 6-12	Wd 6-9	Ws 6-9	I_{b_s}	T_{b_s}	I_{t_s}	T_{I_s}	IST_s	MH_s	MH	T_{125}	H_{850}	T_{850}	P	T	d^2p	SOL
99	140	900	060	080	060	32	71	037	111	033	27	109	50	7	79	35	29	112	501	116	7	13	25	191

	MAX	MIN	PRECIP
PLX	70	50	
LAX	67	49	
BUR	71	48	
LGB	71	44	
CNT	75	42	
PHD	73	31	
PCM	75	54	
SBD	72	37	
SG	74	43	
SA	71	47	

700595

Vsb_{50} T_{min} 50 Precip 6-12 Wind Total $\frac{22}{122}$ Day $\frac{13}{100}$ Tenths = 0.1 CLR

DAILY SUMMARY OF WEATHER DATA STATION: 75N YEAR: 1973 MONTH: Nov. DAY: Tues. DATE: 6

VAR / HR	OZ	E_I	Vsb	V_x	Sky	RH	T	W_d	W_s	W	DD	ff	I_b	T_b	I_t	T_I	IBT	MM	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL	SFO	WMC	TFM	BFL	DAG	TRM
HR		90	80		82	76	74	86	84				70					72														
00								2	3																							
01								2	4																							
02								2	4																							
03								2	4																							
04								16	3																							
05								16	3				sfc																			
06						50	50	2	3				1	11.0	36	4.1	77	32		11.0	507	13.4										
07						50	50	2	3	0																						
08						45	52	2	3	0																						
09						38	58	2	4	0																						
10						36	63	6	2	0.0																						
11						32	68	6	4	0.0																						
12						30	73	10	7	0.0			13	15.8	27	1.3	76		26	19.6	510	13.8										
13			040	H	CLR	34	72	10	8	0.0																						
14			120		CLR	40	70	10	9	0.0																						
15			200		CLR	38	68	10	10	0.0																						
16						36	67	10	6	0																						
17						40	65	10	7																							
18						60	62	10	4																							
19						68	61	10	3																							
20								8	4																							
21								2	3																							
22								2	3																							
23								2	4																							

VAR	OZ max	E_I max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_{b*}	T_{b*}	I_{t*}	ΔT_{I*}	IBT_*	MM_*	MH	T_{125}	H_{850}	T_{850}	ΔP	ΔT	d^2p	SOL
99	110					30	74			032	111	030	1	110	36	41	77	32	26	110	507	134	1	6	6	-

	MAX	MIN	PRECIP
PLX	73	50	
LAX	70	49	
BUR	74	44	
LGB	72	43	
ONT	77	41	
PMD	75	39	
POM	78	44	
SBD	75	37	
SG	76	41	
SA	74	42	

700595

Vsb_{50} ______ T_{min} 50 Precip ______ 6-12 Wind Total 19/108 Day 0/100 Tenths = 0 CLR

DAILY SUMMARY OF WEATHER DATA STATION: 75N YEAR: 1973 MONTH: Nov. DAY: Wed.

DATE: 7

VAR / HR	OZ	E_I	Vsb	Wx	Sky	RH	T	W_d	W_s	N	DD	ff	I_b	T_b	I_t	T_I	IBT	H	MH	T_{125}	H_{650}	T_{650}	ΔP	ΔT	d^2P	SOL	SFO	[illegible]	TPM	EFL	DAG	[illegible]
		90	50		82	76	74	65	84				70					72														
00								2	2																							
01								2	2																							
02								2	3																							
03								2	2																							
04								2	2																							
05								2	3				sfc																			
06						49	54	2	3				1	13.1	20	6.4	77	20		13.0	509	16.8										
07						49	54	2	3	0.1																						
08			020	H	CLR	45	55	2	2	0.1																						
09			020	H	CLR	40	60	6	3	0																						
10			025	H	CLR	33	65	6	3	0																						
11			025	H	CLR	32	70	6	3	0																						
12			030	H	CLR	31	73	10	4	0			6	17.4	35	2.0	84		23	19.8	513	17.0										
13			040	H	CLR	30	76	10	5	0.0																						
14			040	H	CLR	35	75	10	6	0.0																						
15			040	H	CLR	43	74	10	7	0.1																						
16			040	H	CLR	47	73	10	7	0.2																						
17						60	70	10	6																							
18						66	63	10	5																							
19						69	62	10	4																							
20								10	2																							
21								8	2																							
22								10	3																							
23								8	1																							

VAR	OZ max	E_I max	Vsb 60	t 5vm	Vsb 70	RH min	T max			Ws 6-12	Wd 6-9	Ws 6-9	I_{b_a}	T_{b_a}	I_{t_a}	T_{I_a}	IBT_a	MH_a	MH	T_{125}	H_{650}	T_{650}	ΔP	ΔT	d^2P	SOL
99	170	900	020	084	020	30	76			028	111	027	1	131	20	64	77	20	23	130	509	168	516	9	517	168

	MAX	MIN	PRECIP
PLX	75	54	
LAX	72	53	
BUR	78	51	
LGB	71	49	
ONT	79	45	
FMO	83	40	
PDN	79	50	
SBD	77	42	
SG	78	47	
SA	76	49	

Vsb_{50} T_{min} 54 Precip 6-12 Wind Total 17 107 Day 5/100 Tenths = 0 CLR

700595